

MULTIPLE ACCESS, INC. - ACTION STUDY

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MULTIPLE ACCESS, INC. - ACTION STUDY

Prepared For:
CANADA SYSTEMS GROUP

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OCTOBER 1980

MULTIPLE ACCESS, INC. - ACTION STUDY

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I INTRODUCTION

I INTRODUCTION

- INPUT is pleased to submit this report in response to a letter proposal dated July 18, 1980, to Mr. W.W. Beairsto of Canada Systems Group. This report will analyze the market that is available to Multiple Access, Inc. (MAI), a recent acquisition of the Canada Systems Group (CSG).
- The objectives of the study as proposed are to:
 - Submit any and all recommendations to CSG that, in INPUT's best judgement, will achieve the desired MAI operating results for "a stable and predictable revenue stream," and will obtain a 10% pretax profit on sales over a three-year period.
 - Analyze the potential impact of transferring products from CSG to MAI. The markets in the Los Angeles Basin for these transferred products will be derived from existing statistics coupled with the experience and judgement of the INPUT staff. These forecasts will be made on a macro level.
 - Provide a brief synopsis of the competitive environment and highlights of MAI's principle competitors.
 - Make a series of additional recommendations regarding sales/marketing activities, pricing, contracts and operational procedures.

- The above objectives will be accomplished with the understanding that CSG will not invest any significant additional funds in MAI and that any new products or markets must be closely allied to, and synergistic with, the current MAI products, markets and people expertise.
- The methodology employed in this study involved:
 - Initial research to determine the current scope and breadth of services provided by CSG to its customers.
 - Initial research on the history and composition of the MAI organization and its services.
 - A four-day visit to the Los Angeles offices of MAI, during which in-depth interviews were conducted with key management staff.
 - On-site and telephone interviews with key MAI customers.
 - An in-depth review of the possible CSG products that could be transferred to MAI in discussion with the responsible CSG management representatives.
 - A specific analysis of the segments of the market that MAI could address, with marketplace forecasts derived from INPUT's Market Analysis Service.
 - A review of MAI's competitors.

II EXECUTIVE SUMMARY

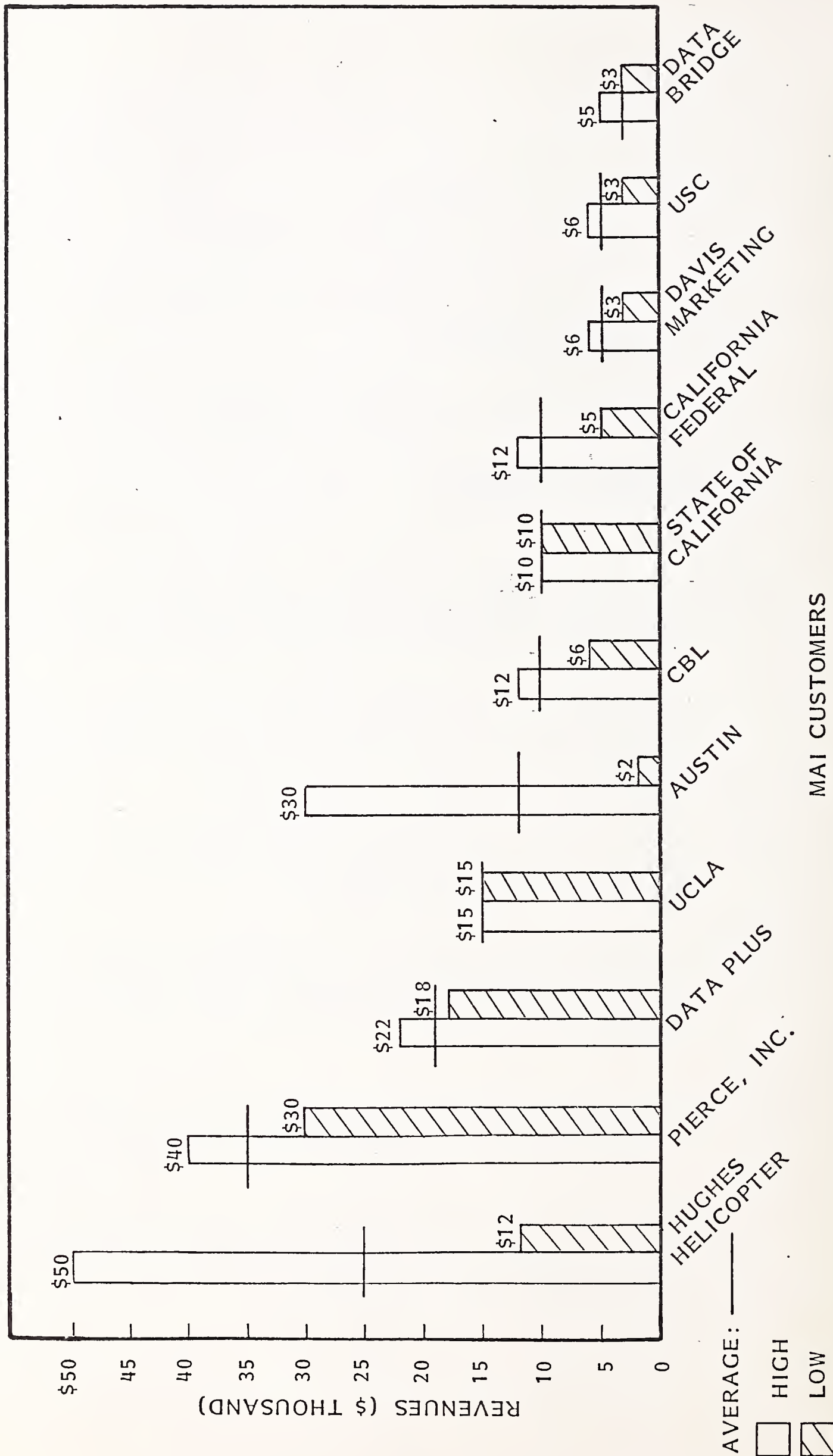
II EXECUTIVE SUMMARY

A. CURRENT SITUATION

- The historical market orientation of MAI has been toward raw machine time sales (utility processing) and dedicated processing for a few large customers.
- The organization is capable of, and enthusiastic in, supporting existing customers, but needs to focus more efforts on raising revenue from new customers.
- Customers are generally pleased with MAI's services and feel that MAI's products are all very price competitive.
- Revenues are spread over a few significant customers, some of which are project-oriented and have fluctuating needs for computer services, as shown in Exhibit II-1.
- The leases on the 360/65s expire March 1981. This will have a positive impact on MAI's profitability of between \$10,000 and \$15,000 per month at that time.
- The lease on the current primary data center facility expires May 1981. A number of benefits will be derived from consolidating the two centers and moving to better facilities, including:

EXHIBIT II-1

REVENUES FROM SIGNIFICANT MAI CUSTOMERS



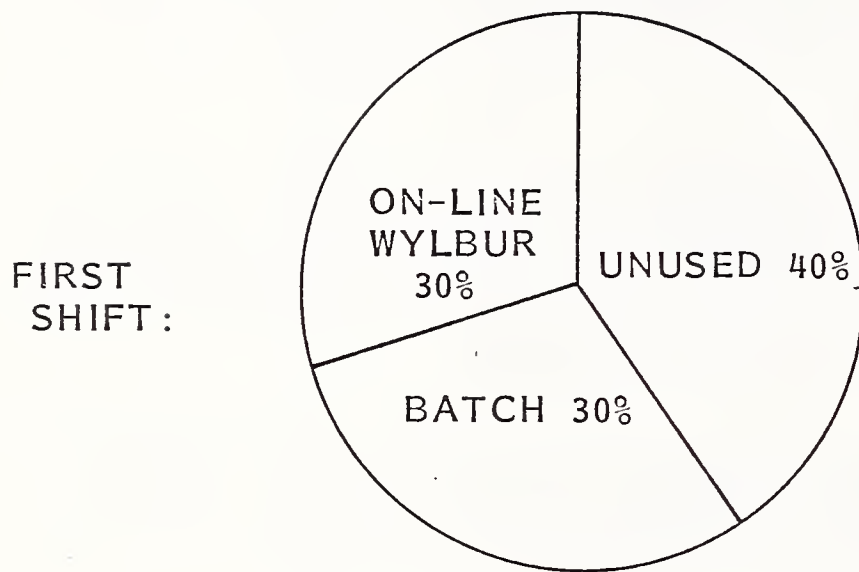
- Better security.
- Better phone services.
- There is a significant amount of unused capacity on the AS/5, which, if sold, would add to revenues without a significant addition to costs, as shown in Exhibit II-2.
- MAI has had good results from selling AMECO, an exclusive CSG program for structural engineers. This program is being converted to run on the AS/5, but technical support for the program and conversion is thin.
- Recent monthly revenues have been \$230,000, with monthly losses of approximately \$30,000. There has not been a significant growth in revenues over the last two years.

B. MARKET FORECASTS AND ANALYSES

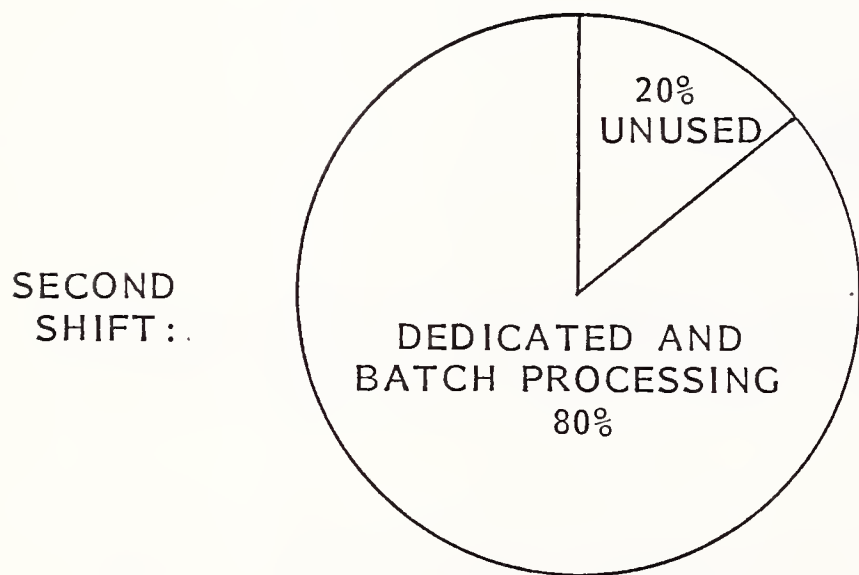
- There is a large and robust market for computer services within the United States. It will be over \$12 billion in 1980, growing at an average annual rate of 19% for the next four years.
- The industry-specialized services of the remote computing services business constitute both the largest and fastest-growing segment. MAI can only exploit this trend in the long term after CSG transfers people, expertise and software programs.
- Short-term results can best be attained by capitalizing on MAI's momentum in the scientific/engineering market segment, particularly in the structural engineering portion.

EXHIBIT II-2

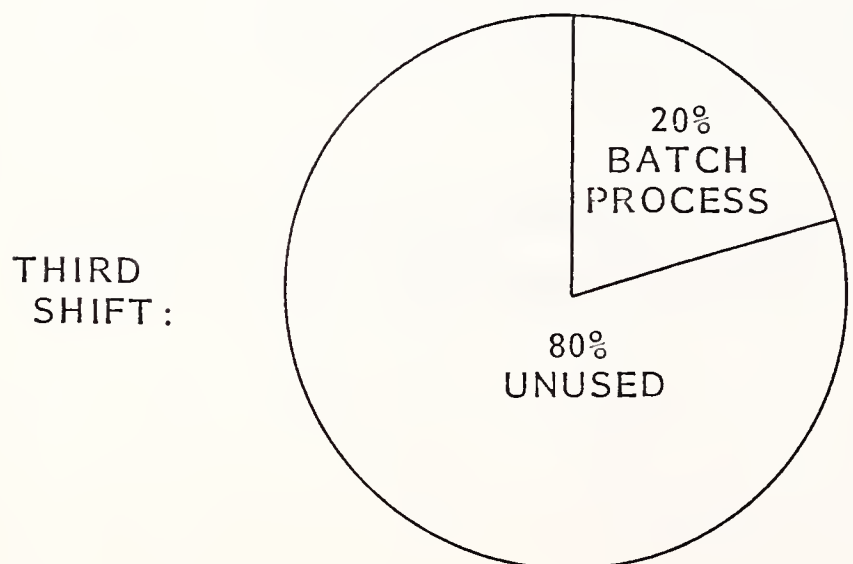
COMPUTER CAPACITY AND MODE OF USE ON AS/5



- 75% OF JOBS DONE ON ALL SHIFTS ARE SUBMITTED VIA WYLBUR TERMINALS



- 20% OF JOBS DONE IN BATCH ON ALL SHIFTS COME FROM HIGH-SPEED RJE TERMINALS



- 5% OF JOBS DONE IN BATCH ON ALL SHIFTS COME OVER THE COUNTER

- Even though the scientific/engineering and utility processing market segments are smaller and slower-growing, MAI still has a sizable market within Los Angeles to deepen its penetration for the short term. It is estimated that the scientific/engineering and utility processing markets will be over \$90 million in L.A. in 1980, as shown in Exhibit II-3.

C. MAI/CSG SYNERGY

- MAI in Los Angeles provides an excellent long-term entry point into the U.S. national markets for CSG. L.A. represents approximately 5% (while California as a whole represents approximately 10%) of the U.S. market for CSG services and products in:
 - Turnkey minicomputer systems.
 - Customized business systems.
 - Industry-specialized services.
- The best intermediate-term synergy is attainable by transferring people expertise and software packages from CSG, particularly the Multiple Access Division, to MAI markets. This includes:
 - STRESS III, BLAST, DOE II, ANASYS and the PCA series.
- The high-speed RJE link to the CDC center in Canada can be used initially to supply these programs. They can then be converted to the AS/5 if necessary at a later time.
- MAI will also benefit in the intermediate term by transferring existing CSG software tools to MAI, including:

EXHIBIT II-3

LOS ANGELES COMPUTER SERVICES* -
MARKET FORECAST BY MODE AND TYPE OF SERVICE

COMPUTER SERVICES		(\$ MILLION)						1979-1989 AAGR
MODE	TYPE	1979	1980	1981	1982	1983	1984	
REMOTE COMPUT- ING SERVICES	GENERAL BUSINESS	\$ 25	\$ 30	\$ 36	\$ 44	\$ 52	\$ 62	20%
	SCI. & ENG.	18	20	24	28	33	38	16
	IND. SPEC.	84	103	125	153	188	229	22
	UTILITY	40	47	57	68	81	96	20
SUBTOTAL		\$167	\$200	\$242	\$293	\$354	\$425	21%
BATCH PROCES- SING	GENERAL BUSINESS	39	44	49	55	62	71	13
	SCI. & ENG.	5	5	5	5	5	5	0
	IND. SPEC.	60	67	72	77	82	86	8
	UTILITY	19	20	20	21	21	21	2
SUBTOTAL		\$123	\$136	\$146	\$158	\$170	\$183	8%
FACILITIES MANAGEMENT		69	79	90	104	119	135	15%
TOTAL PROCESSING		\$359	\$415	\$478	\$555	\$643	\$743	16%

*5.2% OF U.S. MARKET

- CICS, Assembler G (Waterloo), FORTRAN H (extended), PL/I (checkout), WATBOL, WATFIVE.
- Database managers, System 2000, TOTAL.
- Debugging aids, plotting routines and utilities.

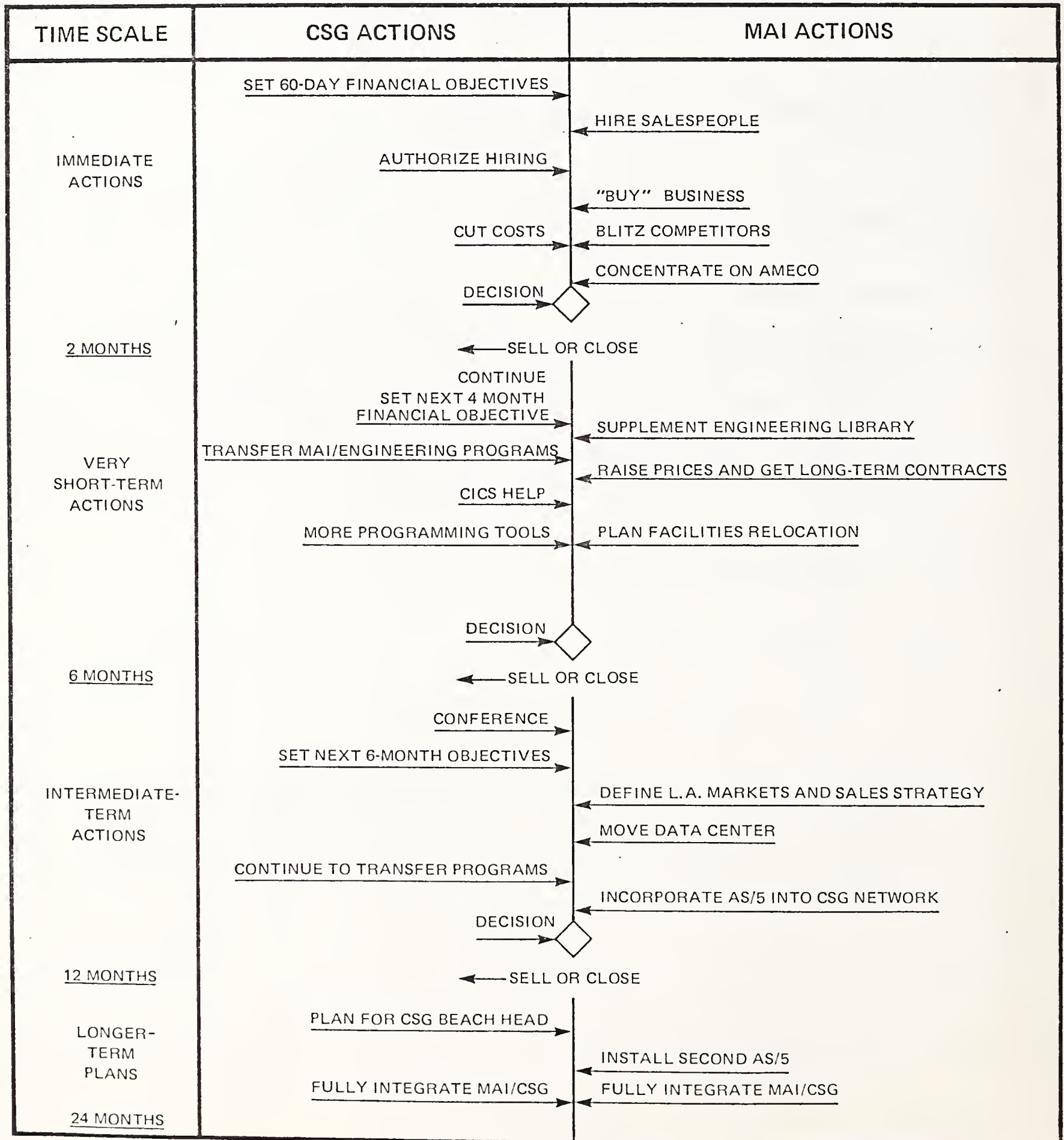
D. RECOMMENDED MANAGEMENT ACTION

I. CONTINUATION OF MAI IN LOS ANGELES

- INPUT recommends that the MAI data center in Los Angeles be continued. However, CSG and MAI managements should agree upon specific financial objectives for timeframes extending through the next twelve months. If these financial objectives are met at each milestone period, management should automatically continue the operation of the center. If the financial objectives are not met, CSG would have to decide whether to:
 - Sell the data center.
 - Close the center.
 - Move the hardware and people to Canada.
- Exhibit II-4 shows a series of specific management actions that will help raise revenues immediately by capitalizing on the momentum at MAI, then gradually shifting the emphasis of the center to the longer-term, faster-growing markets.

EXHIBIT II-4

DECISION FRAMEWORK



2. IMMEDIATE ACTION - FIRST SIXTY DAYS

- Hire two experienced salespeople to sell raw machine time, and offer big commissions.
 - The objective is to add revenue quickly to fill up the unused capacity and thereby improve profits.
- Blitz the competition for possible new customers. Offer deep discounts to entice those customers to move to MAI.
- Complete the AMECO conversion, relying upon CSG help from the author in Montreal.
- Monitor and improve the uptime maintenance and reliability of the AS/5 with log books on downtime, mean time to respond, mean time to repair and regularly scheduled preventive maintenance.

3. VERY SHORT-TERM ACTION - TWO TO SIX MONTHS

- Sell engineering packages through seminars and reference sales from existing customers. Concentrate on structural engineering companies and engineering consulting firms.
- Move more CSG engineering packages to the MAI market.
- Improve teleprocessing, both local and RJE service.
- Plan to move the facilities to a first-story facility in a better telephone zone, providing good customer access and more consistent electrical power.
- Rely upon CSG for CICS technical assistance.

- Raise prices and offer to defer that price increase if customers agree to sign a long-term contract.
4. INTERMEDIATE-TERM ACTION - SIX TO TWELVE MONTHS
- Define market strategy for MAI for the long term, gradually moving toward the industry-specialized services and away from scientific/engineering and utility processing sales.
 - Specifically identify prospects in the various market categories, quantify the number of prospects, define the marketing presentation, set call standards and call reporting systems; in general, do a sales management plan.
5. LONG-TERM ACTION - OVER TWELVE MONTHS
- Assuming the financial objectives were met during the first twelve months, use MAI in Los Angeles to expand the CSG total range of services.
 - Consider putting in a second AS/5 in Los Angeles for backup on those critical on-line applications, which would also provide computer power to other CSG operations within the United States. In any case, the Los Angeles machine(s) should be interconnected to the CSG network for load balancing and sharing of computer capacity.

III CURRENT SITUATION - DESCRIPTION AND EVALUATION

III CURRENT SITUATION - DESCRIPTION AND EVALUATION

A. MARKET ORIENTATION

I. HISTORY

- The MAI data center in Los Angeles has historically had an RJE/batch orientation. It has also done considerable custom processing, raw machine cycle processing and some scientific/engineering application package processing.
- Multiple Access Limited acquired TCC in 1974. TCC had several data centers in various U.S. cities, one of which was Los Angeles. When TCC was sold back to its officers, Multiple Access Limited took over the management of the data centers and subsequently disposed of all except the Los Angeles center.
- The Multiple Access Los Angeles Data Center was located in the Pierce Insurance Company building in 1974. It processed all the Pierce Insurance computer work and also sold excess time to a variety of raw machine users.
- In 1975, the center was relocated to Westwood Boulevard under the management of two Canadians, Gibbs and Jarvis. The center still processed Pierce Insurance Company's work and sought additional raw machine-time customers.

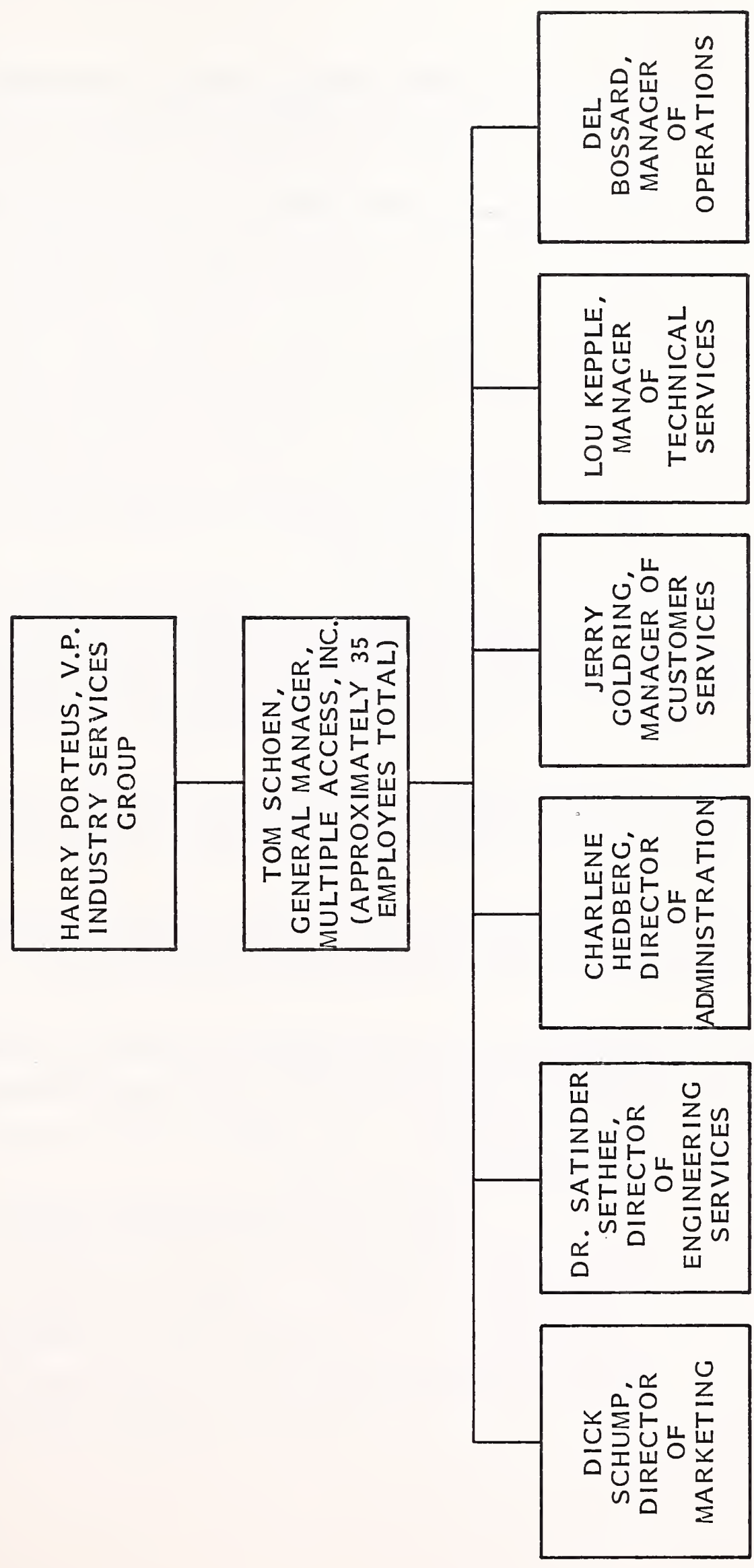
- In the summer of 1977, Tom Schoen was hired by Multiple Access Limited to manage the Los Angeles Data Center. Tom retained the Pierce Insurance business and continued to sell additional machine-time customers, since he was very familiar with that segment of the Los Angeles market.
- Multiple Access Limited was acquired by Canadian Systems Group (CSG) and subsequently renamed MAI in May 1979. The data center operation was dominated by a few large customers and many small machine-time batch customers.
- In 1980, an exclusive engineering package was made available by CSG for structural engineers. MAI has begun to sell this package, called AMECO, with good results during the last few months.

2. ORGANIZATION AND SERVICES

- The organization that Tom Schoen has built is enthusiastic and capable of providing the services to the MAI customers. They have excellent comradery and high spirits, although they are somewhat suspicious of CSG. The general organizational chart is shown in Exhibit III-1.
- According to Dick Schump, Director of Marketing, availability of a standard IBM configuration, responsiveness to immediate, special needs of the customer for machine time and flexibility in terms of pricing and technical support are the three important services offered to MAI customers.
- Dick Schump focuses his selling efforts on the raw machine-time business by contacting potential new businesses referred to him by existing customers. He generally contacts the personnel in the prospect's organization who are running programs on competitive service bureaus.
 - According to Schump, typical new accounts start around \$500 per month and grow to approximately \$7,500 per month. At that time they consider the possibility of going in-house on their own machine.

EXHIBIT III-1

CURRENT MAI ORGANIZATIONAL CHART



- Approximately 70% of the new accounts Dick sells are production-oriented, and approximately 30% are project-oriented.
 - Dick sold approximately 90 new accounts from July 1977 through August 1980. This averages approximately two new accounts per month. However, competitive pressures have reduced the new-account volume recently.
 - Dick estimates that 80% of those new accounts are still customers.
 - Dick is remunerated by a salary plus straight percentage commission for all customers he brings in.
- The customer support organization managed by Jerry Goldring was given high marks by the customers. Customers considered their help very valuable both in tracking down technical solutions and in operational coordination.
 - According to Dr. Satinder Sethee, Director of Engineering Services, the most important services rendered are the special engineering application packages.
 - MAI is currently providing two high-potential engineering applications packages to its customer base: AMECO and NASTRAN.
 - AMECO is a structural engineering program originally written in Canada for which CSG has an exclusive three-year contract. It assists structural engineers in the design as well as analysis of structures fabricated in steel and concrete.
 - MAI is currently using AMECO on the CDC machines in Canada through an RJE terminal. However, it is converting AMECO to run on the AS/5 in Los Angeles. It is estimated that at least one more month of conversion activity is necessary before it will run on the AS/5.

- It was felt that many Los Angeles customers would be reluctant to run on a Canadian machine. In addition, the local MAI data center was not getting revenue credit until recently and it was also having a variety of teleprocessing communications problems on both the low-speed Telenet lines and the high-speed RJE lines.
- NASTRAN offers aircraft structural analysis. MAI does not have an exclusive marketing arrangement on this public domain program.
- NASTRAN is being run by one of MAI's large customers, Hughes Helicopter, as their program for which MAI provides raw machine service.
- ANSYS, like NASTRAN, is a finite element, stress analysis program for structures that is attracting interest among MAI customers. This package does not have interactive graphics, which are needed to provide a competitive edge with McAuto, Cybernet and ISD.
- Charlene Hedberg, Director of Administration, maintains records on types of processing, customer billing history and all expenses.
- Lou Kepple, Manager of Technical Services, converted from DOS to MVS with a minimum of disruption in February 1980, according to customer reports.
- Del Bossard, Manager of Operations, has only recently been promoted to his job and is attempting to cut costs and provide better hardware reliability.

B. EQUIPMENT, SOFTWARE AND FACILITIES

I. EQUIPMENT

- The computer equipment consists of:

- National Advanced Systems AS/5-3 (CPU cycle time slightly faster than IBM 370/158-3). A detailed configuration is shown in Exhibit III-2.
 - Two 360/65s.
 - Assorted I/O gear that includes card-read-punches, Documation 3,000-line-per-minute printers, Telex and Memorex tape drives and 2314, 3330 and 3350 disk storage devices. This I/O gear is shared between the 360/65 and the AS/5.
 - Memorex communications controller to permit both low-speed and high-speed lines to access the AS/5.
- The AS/5 and one 360/65 are housed in the computer room on Westwood Boulevard. The other 360/65 is housed in the basement of a bank building in Panorama City, where it is used to process two customers, an income tax preparation service (Taxon) and the UCLA alumni mailing list.
 - The lease will expire on the two 360/65s in March 1981. Some of the I/O gear associated with the 65s can be transferred to the AS/5. Some of the I/O gear will be assigned to Dataplus, a current customer, who will be taking the responsibility of servicing the MAI DOS customers in early 1981.
 - The AS/5 was installed and operational February 1980 under a unique financial arrangement whereby no out-of-pocket expenses will be incurred until March 1981, when the 65s go off lease. At that time MAI will be committed to a \$9,000-per-month lease on the AS/5.

2. SOFTWARE

- The software running on the AS/5 is the standard IBM MVS21.8. It is supplemented with OBS WYLBUR version 5.1. Also available on the AS/5 is a series of COBOL, FORTRAN, PL/I compilers as well as a series of assemblers and utilities, one of which is Panvalet. Exhibit III-2 shows a complete listing of software.



**Multiple
Access, Inc.**

EXHIBIT III- 2
HARDWARE AND SOFTWARE
CONFIGURATIONS
HARDWARE CONFIGURATION
SYSTEM A

Corporate Offices
1010 Westwood Blvd.,
Los Angeles, Ca. 90024
(213) 474-6565

<u>DESCRIPTION</u>	<u>TYPE</u>
CPU	ITEL AS/5-3*
MEMORY	4 MILLION BYTES
CHANNELS	6 - I/O CHANNELS
DIRECT ACCESS STORAGE:	
3350	10 - SPINDLES (317.5 MB EACH)
3330-11	8 - SPINDLES (200 MB EACH)
3330-1	1 - SPINDLE (100 MB)
2314	24 - SPINDLES (29 MB EACH)
MAGNETIC TAPE:	
800/1600 BPI (9 TRACK)	15 - DRIVES (8 SHARED WITH SYSTEM B)
556/800 BPI (7 TRACK)	1 - DRIVE
1600/6250 BPI (9 TRACK)	4 - DRIVES
CARD READER/PUNCH	1 - IBM 2540 WITH COLUMN BINARY FEATURE
LINE PRINTERS	4 - DOCUMATION 3000 LPM
COMMUNICATIONS	1 - MEMOREX 1380 TELECOMMUNICATIONS PROCESSOR

SOFTWARE CONFIGURATION

SYSTEM A

<u>OPERATING SYSTEMS</u>	<u>COMPILERS</u>	<u>PROGRAMS/UTILITIES</u>
IBM VS 370/MVS	ALGOL	SYNCSORT 4.5 REL 2.2
JES2	ASSEMBLER F	DYL 260 REL 5.0
WYLBUR 4/77	ASSEMBLER G	DYL 250
	COBOL ANS4 LEV 1.5	FDR (FAST DUMP RESTORE)
	COBOL ANS2	CAPEX TLMS
	FORTRAN G	PANVALET
	FORTRAN G1	CICS/VS V1 REL 4**
	FORTRAN H	TOTAL**
	PL1 F	NASTRAN
	PLI OPTIMIZER	BMD
	RPG	BMDP
	VM/VS ASSEMBLER X	

* CPU CYCLE TIME FASTER THAN IBM 370/158-3

** PLANNED

- The software that is currently running on the 360/65s includes a special DOS operating system by Software Pursuits that permits multiprogramming with a variable number of tasks. A special DOS is running on the Panorama City model 65 for UCLA.
- The software are for the most part standard IBM versions and have been quite reliable.

3. FACILITIES

- The facilities consist of a lease on the third floor of 1010 Westwood Boulevard. This facility is approximately 10,000 square feet, for which MAI pays approximately \$12,000 per month. This space has access through a parking structure for customer pickup and delivery, although the entrance to the parking structure is not well marked. The space is poorly laid out and does not provide for a secure computer room.
- The facility in Panorama City consists of approximately 6,000 square feet, for which MAI pays approximately \$5,000, with \$2,000 being offset by Taxon, the customer that shares the facility with MAI. This facility is in the basement of a bank building with good security and parking, but very poor access for customer pickup and delivery.

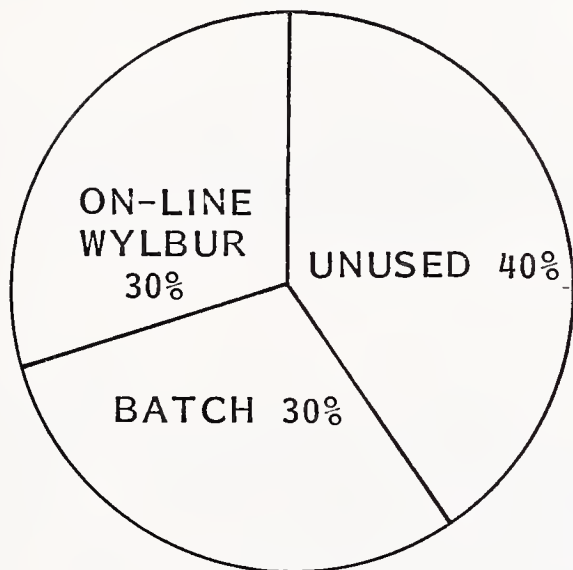
4. CAPACITY

- There appears to be a substantial amount of unused capacity on the AS/5: first shift, 40%; second shift, 20%; third shift, 80%. These unused capacity figures, shown in Exhibit III-3, were derived from the best estimates of MAI management.
- Seventy-five percent of the jobs that are done in batch processing mode are submitted through WYLBUR terminals, 20% come through high-speed RJE terminals, and 5% come over the counter.

EXHIBIT III-3

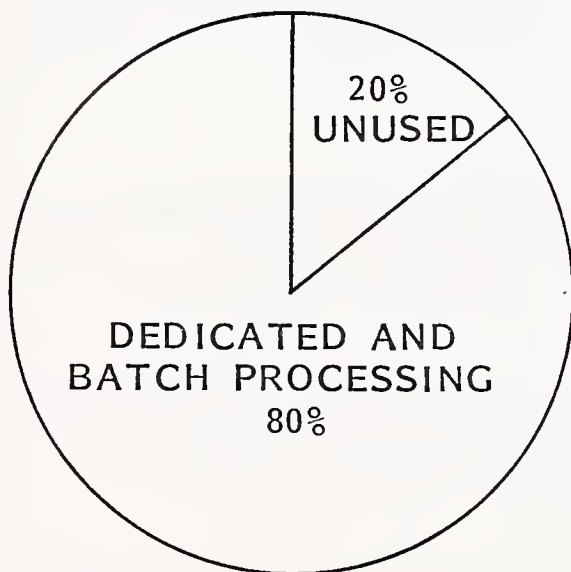
COMPUTER CAPACITY AND MODE OF USE ON AS/5

FIRST
SHIFT:



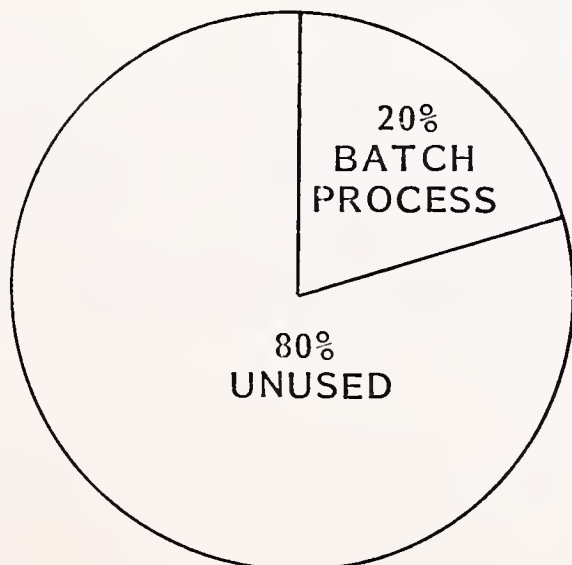
- 75% OF JOBS DONE ON ALL SHIFTS ARE SUBMITTED VIA WYLBUR TERMINALS

SECOND
SHIFT:



- 20% OF JOBS DONE IN BATCH ON ALL SHIFTS COME FROM HIGH-SPEED RJE TERMINALS

THIRD
SHIFT:

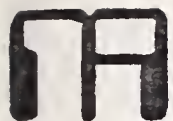


- 5% OF JOBS DONE IN BATCH ON ALL SHIFTS COME OVER THE COUNTER

- There is a substantial portion of both 360/65s' capacity that is unused. However, it is difficult to sell DOS time and therefore unlikely that the unused capacity can be filled on these machines.

C. CUSTOMERS AND PRICING

- The customers visited were generally complimentary toward the MAI staff concerning the latter's customer services and operational and technical assistance.
- Most of the customers interviewed had been with MAI for several years and had no plans to move to another vendor.
- Nearly every customer had a unique contract with special discount provisions. Exhibit III-4 contains a copy of the standard contract. Exhibit III-5 contains a copy of the standard price schedule.
- Exhibit III-6 shows revenues from significant MAI customers, while Exhibit III-7 shows revenue sources, by customer and by type of processing.
- Most contracts are 30-day cancellable, with the exception of a few big customers like the State of California, which has a three-year contract.
- Most customers have discounts from the standard price schedule ranging from 20% to 30% on raw machine-time resources used.
- Most customers feel that the pricing is very competitive. They feel MAI is among the lowest-priced data centers in Los Angeles. However, certain jobs that require a high amount of CPU may not be price competitive with the current algorithm. Similarly, more charges for I/O could be made without negative competitive impact.



**Multiple
Access, Inc.**

EXHIBIT III-4
**STANDARD MAI CONTRACT
COMPUTING SERVICE AGREEMENT**

Customer's Name Agreement No
.....
Address Invoice Reference.....
.....
City
..... Telephone

Customer warrants that the above "customer's name" is the true legal and lawful name of his company, partnership or business and that it is authorized to do business in the State of California.

Customer's Initials Date

hereinafter called the "Customer":

Multiple Access, Inc. (hereinafter called "MA") by accepting this Agreement at its Head Office, agrees to furnish the customer access to its Computing Service in accordance with the terms and conditions set forth herein and in any Schedule attached hereto bearing the same agreement number as appears above and initialled by an authorized signatory of MA. Computing Service shall comprise the Services indicated in the attached schedules for the Customer's use during the scheduled hours.

The provisions hereof, together with any schedule attached as aforesaid, shall constitute the entire Agreement between the parties hereto and provided that in the event of any conflict between the provisions hereof and any attached schedule, the attached schedule shall govern.

Prior Agreement Number dated is hereby terminated.

This Agreement shall be interpreted in accordance with the laws of the State of and the parties hereto irrevocably attorn to the jurisdiction of the courts of such state.

This Agreement shall commence on the date of acceptance by Multiple Access, Inc. below and shall remain in effect as per Paragraph 2 of the TERMS AND CONDITIONS; or, the DATE OF COMMENCEMENT shall be and shall continue for months until the DATE OF EXPIRY after which DATE OF EXPIRY this Agreement shall continue on a month to month basis until terminated by either party on providing to the other party at least thirty (30) days written notice of termination.

The foregoing is hereby agreed to:

A Member of the
Multiple Access
Computer Group

MULTIPLE ACCESS, INC.

Name of Customer

BY: _____

Authorized Signature

BY: _____

Authorized Signature

Address

Title

City and State

DATE: _____

DATE: _____

Name of Multiple Access, Inc. Marketing Representative

Branch Office Location

Telephone Number

INPUT

EXHIBIT III-4 (CONT.)
STANDARD MAI CONTRACT

TERMS AND CONDITIONS

1. DEFINITIONS

- (a) Machine units and system seconds will be calculated according to the appropriate accounting formula.
- (b) All references to time shall mean the local time in effect at MA's computer site as defined in each schedule.

2. TERM AND TERMINATION

This agreement shall be effective from the date of its acceptance by MA and shall remain in full force and effect unless otherwise provided herein. However this contract may be terminated by either party after at least thirty (30) days prior notice. The customer's obligation is to pay all charges which shall have accrued shall survive termination of this agreement.

3. CHARGES

Initials

- (a) Charges incurred hereunder shall be paid in full within ten (10) days of date of invoice. Thereafter, delinquency charges may be levied and be payable at the rate of one and one-half (1½) percent per month. Customer agrees to pay all costs of collecting delinquent accounts including but not limited to all attorney's fees and charges by collection agencies.
- (b) MULTIPLE ACCESS reserves the right to change the charges on thirty (30) days written notice to the Customer.
- (c) The prices specified herein do not include retail sales, use, excise or similar taxes. Consequently, in addition to the charges specified therein, the amount of retail sales, use, excise or similar taxes applicable shall be paid by the Customer or in lieu thereof the Customer shall provide MA with a valid tax exemption certificate.
- (d) Communication line charges are the responsibility of the Customer and are payable directly to the common carrier.
- (e) MA will not be responsible for nor obligated to perform any services unless specified in this Agreement. Charges for miscellaneous services and supplies requested by the Customer will be made at MA's standard rates.
- (f) Property in physical media prepared by MA for, on behalf of or at the direction of the Customer shall remain in MA until delivery thereof to the Customer. MA may, at its sole discretion, retain possession of such physical media and any physical media delivered to it by the Customer for any purpose whatsoever, until such time as all charges hereunder which have been invoiced to the Customer, together with interest thereon, if any, have been paid in full and MA shall not be liable for any direct, indirect, special or consequential damages arising out of or by reason of such retention.

4. SECURITY CODES

MA will validate for the Customer the following of which (b) and (c) will be provided by the Customer.

- (a) A four (4) character contract code.
- (b) As many five (5) character user numbers as may reasonably be required.
- (c) A four (4) character security code for each user number.

5. MODIFICATIONS

MA reserves the right to make changes in its equipment configuration, methods and rules of operation, accessibility periods, customer identification procedures, or system 'software' if, in the opinion of MA, such changes or modifications are necessary or desirable to improve its services.

6. LIABILITIES

- (a) There are no warranties expressed or implied, oral or written, in fact or by operation of law or otherwise, except as herein expressly stated. In no event shall MA be liable for any indirect, special or consequential damage for any reason whatsoever including any damage arising out of the existence, furnishing, functioning or the Customer's use of services provided for in this Agreement.
- (b) MA's liability for direct damages with respect to this Agreement shall be limited to the total charge for services performed herein to date. The Customer agrees to submit proper documentation to MA supporting any Customer Credit Request within 72 hours of the incident. Documentation supporting Hardware and/or Software problems shall include proof of rerun of the same job which experienced such problem(s).
- (c) MA shall have the right, at its expense and option and in full satisfaction of any claims of Customer in respect thereof, to correct any alleged errors which are due solely to malfunction of the Computer equipment or the failure of its software or its employees.
- (d) MA shall not accept any credit requests for problems for which the cost is under \$2.00.
- (e) MA shall not accept any credit requests for problems which arise when the Customer is using a Type 3 or Type 4 (use at your own risk) application program.
- (f) If MA applies a credit amount for the correction of such errors that may occur from time to time, such amount shall in general be limited to a maximum of two hundred dollars (\$200), which shall include the step cost in which the failure occurred plus recovery costs that may be necessary.
- (g) MA shall not be held liable for expenses incurred subsequent to accepting consulting advice given by MA's employees.
- (h) The Customer agrees to indemnify MA and to hold it harmless from any loss or liability to the Customer, or to any third parties, for any injuries or damages not caused by MA's negligence which result from the Customer's use and operations of the machines, or the Customer's use of MA's premises or premises which MA is authorized to use.
- (i) The Customer accepts sole responsibility for the adequacy and accuracy of source data, programs and/or procedures and for all results obtained therefrom. The Customer is responsible for assuring the proper use of audit controls, appropriate backup files, backup programs and for establishing all reasonable check points appropriate for the Customer's intended use of computing services.

7. OTHER

- (a) All physical media provided by the Customer to MA for processing shall meet the specifications of the manufacturer of the equipment on which such media is to operate.
- (b) For the convenience of its customers authorized to be on site, MA will endeavor to provide a reasonable amount of working space and technical counselling at its computer site.
- (c) MA will use its best efforts to process the work in an expedient manner, but reserves the right to schedule the work in such a way as will, in the opinion of MA, improve the efficiency of the configuration.
- (d) All data relating to the Customer's business which is submitted by the Customer to MA pursuant to this Agreement will be safeguarded by MA to the same extent that MA safeguards data relating to its own business, provided however, if such data is publicly available, or is already in MA's possession, or known to it, or was rightfully obtained by MA from third parties, MA shall bear no responsibility for its disclosure, inadvertent or otherwise.
- (e) All programs, specifications, routines or techniques which are disclosed or made available by MA to the Customer, shall remain the property of MA and the Customer will not disclose or make the same available to any third party, without the written consent of MA.
- (f) This Agreement may not be assigned without the written consent of MA.
- (g) Customs Duty is the Customer's responsibility as to clearance and payment.

EXHIBIT III-5
STANDARD MAI PRICE SCHEDULE
SCHEDULE B

ITEL AS/5-3

TO AGREEMENT NO. _____ MULTIPLE ACCESS, INC. per _____

SPECIAL TERMS AND CONDITIONS

1. IBM SYSTEMS USAGE

STANDARD

ITEL AS/5-3 OS/MVS/JES2

\$1.85 per machine unit

2. WYLBUR SYSTEMS USAGE (110, 300 Baud)

\$4.00 per terminal connect hour

.50 per CPU second

.028 per 3330 track per day (13030 characters)

3. JES2 RJE SYSTEMS USAGE (2400, 4800 Baud)

Charges based on the extent of usage

4. NON-WYLBUR ON-LINE STORAGE

.010 per 3330 track per day (13030 characters)

5. OPERATOR CHARGES

Tape Cataloging

\$.30 per reel

Tape Mounts

.50 per mount

Forms Changes

2.25 per change

Non-Standard Print Train

5.50 per change

Disk Mounts

.75 per mount

6. OFF-LINE STORAGE

2314 Disk Pack Rental

\$13.50 per month

2314 Disk Pack Storage

\$13.50 per month

MAI Tape Rental and Storage

3.50 per month per reel

Customer Tape Storage

1.50 per month per reel

7. UNIT RECORD CHARGES STANDARD MAI PRICE SCHEDULE

Printing and Punching

-Customer supplied stock...\$.12 per 1000 lines or 1000 cards

-M.A. supplied stock (14 7/8 x 8½ - 8 LPIN) - charged on a stacked inch basis as follows:

<u>Stock</u>		<u>Per Stacked Inch</u>
14 7/8 x 8½	1 Ply	3.15 per inch
14 7/8 x 8½	2 Ply	3.75 per inch
14 7/8 x 8½	3 Ply	3.90 per inch
14 7/8 x 8½	4 Ply	3.95 per inch
14 7/8 x 8½	5 Ply	4.25 per inch
14 7/8 x 8½	6 Ply	4.35 per inch
Cards		.60 per inch
Paper Tape		4.00/Reel

8. PROGRAMMING SERVICES

Available on a project basis

9. MISCELLANEOUS SERVICES

Keypunching/Verification	\$10.00/Hr.
Bursting/Decollating	\$15.00/hr.
Computer Microfiche	\$ 2.35 per original .15 per duplicate
Pickup and/or Delivery	Cost plus 15%
Off Line Printing:	
1,000 Lines Per Min.	\$25.00/hr.
1,550 Lines Per Min.	\$34.00/hr.
1,800 Lines Per Min.	\$40.00/hr.
3,000 Lines Per Min.	\$63.00/hr.

Notes:

- (1) No invoice will be issued if no services are used.
Minimum invoice charge is \$25.00.
- (2) For other required services please contact your
Marketing Representative.

REVENUES FROM SIGNIFICANT MAI CUSTOMERS

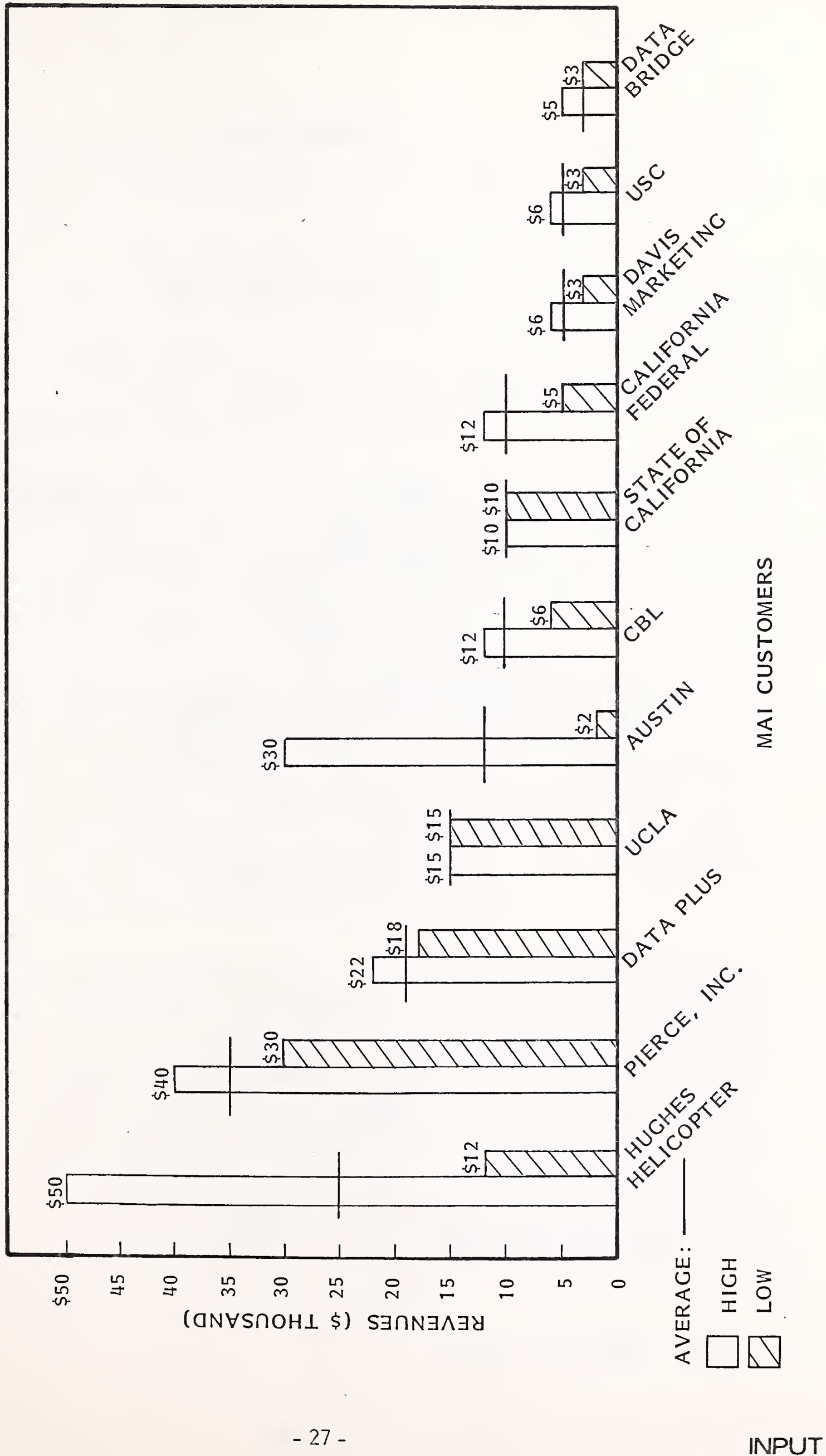
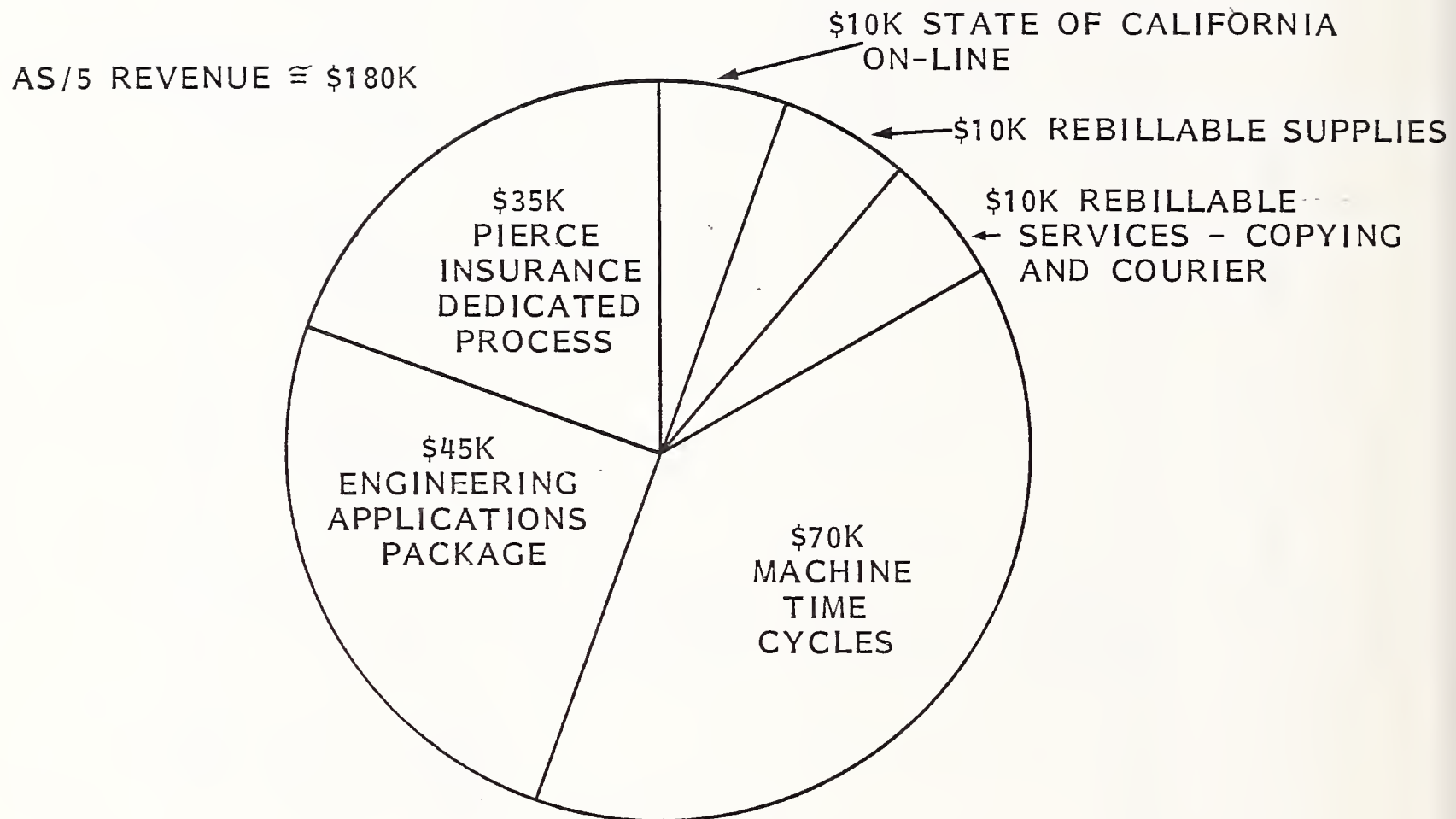
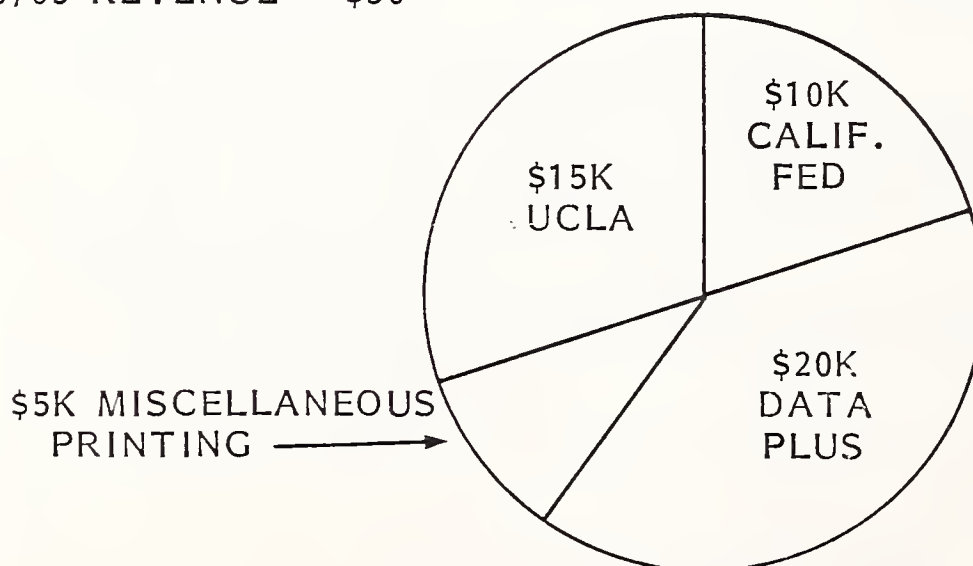


EXHIBIT III-7

REVENUE SOURCES FOR MAI (TYPICAL MONTH: 6/80)



360/65 REVENUE \cong \$50



TOTAL REVENUE = \$230K

- The following customer portraits provide brief descriptions of the MAI system in use as well as some general observations about the service. These customer observations are drawn from on-site and telephone interviews.

- Hughes Helicopter is currently using its own NASTRAN program on the AS/5 along with general FORTRAN, COBOL and PL/I development compilers. It likes the SELECT utility and the immediate availability of the service. Although the company has been with MAI for three years, it may plan to go in-house in the future.
- Pierce Insurance runs a DOS version of its premium accounting package. It plans to go to LIFE 70 within the next few months, which will require MAI to bring up CICS. Pierce has been processing with MAI for many years, and the president of Pierce is on very friendly terms with Tom Schoen.
- The Austin Company is the seventh largest engineering/construction company in the U.S. Its Western district office in Irvine is a significant user of MAI. There are approximately 10-15 professional engineers trained to use the AMECO system, and they have promoted AMECO with Austin nationwide. They are generally happy with MAI's service but would like to have graphics plotting capability and higher-speed output nearer to their office in Orange County.
- Commerical Bankers' Life, which has been using MAI and its predecessor company since 1975, is generally happy with the service. It uses WYLBUR extensively for program development and has its entire accounting program resident on MAI. It has recently installed an HP3000 on which it is doing on-line data entry and will be doing some on-line quotation for agents in the future. Although there is a threat that the processing may be moved to the HP3000, it is unlikely in the near future because of MAI's competitive pricing and good service. The company is on a one-year contract renewed annually.

- Data Plus is a small DOS service bureau that was moved to the 360/65 when Pierce Insurance converted to the AS/5. When Data Plus installs its Omega system, it will be assigned most of the DOS customers now being serviced by MAI. It will also assume responsibility for some of the I/O gear, operations people and utilities currently paid for by MAI and used on the 360/65.
- UCLA processes alumni solicitation applications through a quasi-facilities-management contract with MAI. This is done on a 360/65 located in the Panorama City facility. Although this business is on a short-term contract, UCLA feels that it is very competitively priced. It is unlikely to leave MAI.
- USC is designing information systems in COBOL and BASIC for government and other higher education organizations' use. It likes the availability of the system and submits most jobs through WYLBUR. It feels that it gets better prices through MAI than it gets through its in-house computer.
- California Federal Savings and Loan currently uses DOS on the 360/65. It may move with Data Plus if the 360/65 service is terminated. It is generally happy with MAI and feels the price is quite competitive.
- Davis Market Research has been using the MAI service for three years for a series of custom programs doing cross-tabulation for market research applications. It uses the BIOMED package and some WYLBUR. It feels that MAI people are responsive and available for short-term, special runs when necessary.
- The State of California has an on-line program up for the Department of Corporations. This on-line data base allows State of California personnel to access the system from five different terminals in four different cities in the state to find the status of companies requesting corporate commission approvals. This three-year contract was won in

early 1980 in a three-month competitive bidding process. The charges include \$7,500 per month of reasonably fixed charges for storage and connect time, with approximately \$2,500 per month in transaction charges.

- DataBridge is a small service bureau that prepares mailing labels for private lists generated by colleges and schools. It has been using MAI for approximately three years and is generally pleased with the services and competitive prices. It particularly enjoys the responsiveness that gets special jobs done quickly.

D. FINANCIAL CONSIDERATIONS

- MAI had \$2.6 million in revenues in fiscal year ending 3/31/79, and \$2.7 million in fiscal 1980.
- Recently MAI revenues have been approximately \$230,000 per month. The monthly losses have been averaging approximately \$30,000.
- Some of the expenses are principal and interest payments for loans taken out to buy acquisitions in previous years, including:
 - Four thousand dollars per month interest only on a \$500,000 loan to buy GCC.
 - Twelve thousand dollars per month interest and principal for repayment of the \$600,000 loan in connection with Pierce Insurance.
 - There is also approximately \$2,000 amortized expenses for the GCC and TCC acquisitions.

- The lease on the two 360/65s expires March 22, 1981. At that time one or both of the machines may be returned, resulting in a \$10,000 to \$15,000 positive financial impact on MAI, as shown in Exhibit III-8.
- The lease on the Westwood Boulevard facility expires in May 1981. This presents an interesting opportunity to consolidate and/or relocate the data center. The Panorama City facility, however, is on long-term lease and must be considered in any relocation plans.
- Drawn from a recent study by INPUT for ADAPSO, the average revenue per employee and average profit per employee are listed below. MAI compares very favorably on the revenue per employee but not on the profit per employee.

	<u>ADAPSO Respondent Companies</u>	<u>MAI</u>
- Average revenue per employee of processing companies (\$2-10M/Yr)	\$ 30,000	\$ 75,000
- Average profit per employee of processing companys (\$2-10 M/Yr)	\$ 2,000	\$ -8,000

- Again, according to the same ADAPSO study, companies in the \$2-10 million range showed 7% pretax profits as a percent of revenue. They also had a return on assets of 11%, and trade receivables outstanding of 46 days.
- Exhibit III-9 shows the expenditure patterns as a percent of revenues for the ADAPSO respondent companies. This pattern may be used as a guide to review expenses at MAI.

E. COMPETITION

- With current market orientation to sell machine time, MAI has a relatively undifferentiated service. Competition for new customers is based on available

EXHIBIT III-8
FINANCIAL IMPACT OF 360/65 LEASE EXPIRATION ON 3/81

ITEM	SITUATION A: BOTH 360/65s ARE REMOVED 3/81	SITUATION B: ONLY ONE 360/65 IS REMOVED 3/81
REVENUE LOSSES:		
- UCLA	-\$15,000	-
- DATA PLUS	- 20,000	-\$20,000
- CALIFORNIA FEDERAL (NET OF COMMISSIONS)	- 9,000	- 9,000
- ORC	- 3,000	- 3,000
- AVERAGE TAXON/MISCELLANEOUS	- 3,000	-
NET REVENUE LOSS	-\$50,000	-\$32,000
REDUCED EXPENSE:		
- LEASE ON 65s INCLUDING PERIPHERALS MAINTENANCE AND UTILITIES	-\$53,000	-\$53,000
- ADD BACK PERIPHERALS, MAINTENANCE AND UTILITIES FOR AS/5	+ 6,000	+ 6,000
- ADD BACK REPLACEMENT MACHINE FOR 65 OR LOWER LEASE ON EXISTING 65		+ 11,000
- ADDED MAINTENANCE, UTILITIES FOR MACHINE		+ 5,000
- RENT ON PANORAMA CITY FACILITY*	- 5,000	- 2,000
- ASSIGNED DATA PLUS EXPENSES: PAYROLL, UTILITIES AND SUPPLIES	- 10,000	- 10,000
NET EXPENSE REDUCTION**	-\$62,000	-\$43,000
POSITIVE IMPACT ON PROFIT AND LOSS STATEMENT	+\$12,000	+\$11,000

* LONG-TERM LEASE, MAY NOT BE EASILY BROKEN

**THESE EXPENSE REDUCTIONS HAVE BEEN CONSERVATIVELY ESTIMATED, SO POSITIVE IMPACT MAY BE HIGHER

EXHIBIT III-9

TYPICAL EXPENDITURE PATTERNS AMONG COMPUTER SERVICES COMPANIES

CATEGORY OF EXPENDITURE	PERCENT OF TOTAL 1979 REVENUES, PROCESSING SERVICES
MARKETING AND SALES	
• SALARIES, COMMISSIONS, BONUSES	11%
• FRINGE BENEFITS	2
• TRAVEL, ENTERTAINMENT, OTHER	8
RESEARCH AND PRODUCT DEVELOPMENT	5
OPERATIONS	
• PERSONNEL	
- SALARIES	17
- FRINGE BENEFITS	2
• COMPUTER SYSTEMS EQUIPMENT AND MAINTENANCE	11
• OTHER EQUIPMENT AND FACILITIES	11
• DATA COMMUNICATIONS	5
GENERAL ADMINISTRATIVE	10
ALL OTHER	8
PROFIT	10
TOTAL	100%

SOURCE: ADAPSO COMPUTER SERVICES ANNUAL REPORT, 1980

access to machines and price. After becoming a customer, the customer services help and operations cooperation are most important. As more applications are added, price becomes less important as a competitive factor.

- Appendix A contains "Company Highlights" of major competitors. Some observations about a few of the frequently encountered firms:
 - Mellonics has only \$7 million in non-captive processing revenues.
 - Optimum Systems offers Super WYLBUR.
 - Information Systems Design offers more engineering packages.
 - United Computing is moving heavily toward engineering applications.
 - MCRB, with services located in North Hollywood, is specializing in selling mailing lists and utility machine time.

IV MARKET FORECASTS AND ANALYSES

IV MARKET FORECASTS AND ANALYSES

A. U.S. COMPUTER SERVICES FORECAST, 1979-1984

- According to INPUT's Market Analysis Service, the total computer services market nationally should exceed \$12 billion in 1980, with the IBM software services portion rising over \$700 million. This represents an average annual growth rate through 1984 of 19%.
- The remote computing services portion of the total computer services market is growing at a much faster rate (21%) than the batch portion (8%), as shown in Exhibit IV-1.
- The specialized industry services' portion of the market is by far the largest (almost 40%) and is growing at a faster rate.
- All figures are in current dollars. They include a 9% factor for inflation between 1979 and 1980, and a 7% factor for inflation between 1981 and 1984.
- MAI's historical market orientation has been in the slowest growth portions of the computer services market:
 - Batch utility.
 - Batch scientific/engineering.

EXHIBIT IV-1

U.S. COMPUTER SERVICES - MARKET FORECAST
BY MODE AND TYPE OF SERVICE

COMPUTER SERVICES		(\$ MILLION)						1979-1984 AAGR
MODE	TYPE	1979	1980	1981	1982	1983	1984	
REMOTE COMPUT- ING SERVICES	GENERAL BUSINESS	\$ 480	\$ 580	\$ 690	\$ 840	\$1,000	\$1,190	20%
	SCI. & ENG.	340	390	460	540	630	730	16
	IND. SPEC.	1,610	1,980	2,410	2,950	3,610	4,410	22
	UTILITY	760	900	1,090	1,310	1,550	1,840	20
SUBTOTAL		\$3,190	\$3,850	\$4,650	\$5,640	\$6,790	\$8,170	21%
BATCH PROCES- SING	GENERAL BUSINESS	750	840	950	1,060	1,200	1,360	13
	SCI. & ENG.	100	100	100	100	100	100	0
	IND. SPEC.	1,150	1,290	1,390	1,490	1,570	1,660	5
	UTILITY	370	380	390	400	400	410	2
SUBTOTAL		\$2,370	\$2,610	\$2,830	\$3,050	\$3,270	\$3,530	8%
FACILITIES MANAGEMENT		1,320	1,510	1,730	2,000	2,280	2,600	15
SOFTWARE PRODUCTS		1,700	2,170	2,780	3,580	4,670	6,110	29
PROFESSIONAL SERVICES		1,620	1,920	2,270	2,700	3,200	3,800	19
GRAND TOTAL		\$10,200	\$12,060	\$14,260	\$16,970	\$20,210	\$24,210	19%

SOURCE: MAS ANNUAL REPORT, 1979

- Utility services are those where the vendor provides raw machine access to the computer as well as basic systems software and languages.
- MAI is moving into remote computing services:
 - Utility (growth rate 20%).
 - Scientific/engineering (growth rate 16%).

B. SCIENTIFIC AND ENGINEERING PROCESSING MARKET

- Exhibit IV-2 shows that MAI has long been servicing the largest marketplaces in the scientific/engineering sector apart from the federal government:
 - Services firms, which include engineering and construction firms such as Austin.
 - Discrete manufacturing firms such as Hughes Helicopter.
- This market will continue to grow at a slower pace (13%) than the total market (19%), as shown in Exhibit IV-2.
- Market opportunities exist in several areas, including the integration of graphics capability with engineering programs so that output can be directed towards plotters or CRTs.
- Competitive activity includes Boeing Computer Services' introduction of a library of 24 computer-aided design modeling and graphics programs. McAuto is offering STRUDL for the structural engineering community.

EXHIBIT IV-2

SCIENTIFIC AND ENGINEERING PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984 (\$ MILLION)						AAGR 1979- 1984
	1979	1980	1981	1982	1983	1984	
DISCRETE MANUFACTURING	\$ 86	\$ 94	\$108	\$129	\$156	\$183	16%
PROCESS MANUFACTURING	50	60	67	77	89	104	16
TRANSPORTATION	5	5	6	6	7	7	7
UTILITIES	71	78	86	96	106	118	11
BANKING AND FINANCE	-	-	-	-	-	-	-
INSURANCE	-	-	-	-	-	-	-
MEDICAL	2	2	3	3	3	4	15
EDUCATION	9	10	10	11	12	13	8
RETAIL *	-	-	-	-	-	-	-
WHOLESALE *	-	-	-	-	-	-	-
FEDERAL GOVERNMENT	165	179	199	217	233	251	9
STATE AND LOCAL GOVERNMENT	5	8	12	17	22	27	40
SERVICES	104	115	127	143	162	181	12
OTHER	47	54	62	72	83	94	15
TOTAL	\$544	\$605	\$680	\$771	\$873	\$982	13%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN \$4 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

SOURCE: MAS ANNUAL REPORT, 1979

C. UTILITY PROCESSING SERVICES MARKET

- With the exception of the federal government, MAI has been servicing the major industry sectors of this marketplace, as shown in Exhibit IV-3:
 - Discrete manufacturing (such as Hughes Helicopter) and the services industry (including engineering firms such as Austin).
 - Insurance for firms such as Pierce Insurance.
- This marketplace, which provides access to a machine and basic systems software plus languages, has been the traditional market orientation for MAI. However, it will be growing at an average annual growth rate of 15%, which is less than the industry average.
- New market opportunities exist in providing access to data base management systems.
 - Cincom's TOTAL is the most widely used.
 - Cullinane, the second largest independent data base vendor, has IDMS, a data base software product.
- Utility processing services will be an increasingly difficult market to penetrate as they become more of a commodity on undifferentiated machine time, unless special software tools are provided to augment mere access to the computer.

EXHIBIT IV-3

UTILITY PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984 (\$ MILLION)						AAGR 1979- 1984
	1979	1980	1981	1982	1983	1984	
DISCRETE MANUFACTURING	\$ 159	\$ 181	\$ 207	\$ 233	\$ 264	\$ 303	14%
PROCESS MANUFACTURING	136	150	163	194	222	252	13
TRANSPORTATION	34	39	44	49	54	59	12
UTILITIES	107	119	132	145	157	170	10
BANKING AND FINANCE	51	58	65	73	82	95	13
INSURANCE	30	32	35	39	42	46	11
MEDICAL	14	15	17	19	21	24	11
EDUCATION	27	29	31	32	33	34	5
RETAIL	56	62	68	77	86	98	12
WHOLESALE	112	120	129	136	143	150	6
FEDERAL GOVERNMENT	427	503	608	730	880	1,050	20
STATE AND LOCAL GOVERNMENT	86	97	117	137	156	177	16
SERVICES	59	71	86	103	121	143	19
OTHER	76	89	105	122	143	166	17
TOTAL	\$1,374	\$1,565	\$1,807	\$2,089	\$2,404	\$2,767	15%

SOURCE: MAS ANNUAL REPORT, 1979

D. MARKET FORECAST FOR LOS ANGELES

- The dollar market forecast for Los Angeles was extrapolated from large-scale IBM computer population counts and computer site counts. Large-scale IBM systems indicate 360/40s or larger.
- There are 1,500 computer sites within 50 miles of downtown Los Angeles. This is 4.6% of the total 32,500 U.S. sites.
- There are 660 large-scale IBM computers within 50 miles of downtown Los Angeles. This is 5.6% of the 11,700 large-scale IBM computer systems installed nationally.
- California has 3,300 (10.3%) of the 32,500 total computer sites and 6,900 (11.4%) of the 60,300 total computer systems installed nationally. Los Angeles is generally considered to represent about half of the total California market, or 5.1% to 5.7% of the national market.
- INPUT used 5.2% of the national market as the market for computer services in the Los Angeles area based upon the above evidence. The Los Angeles market for computer services is shown in Exhibits IV-4 and IV-5.

E. MAI'S LOS ANGELES MARKET

- MAI must continue to move away from batch processing to remote computing services (RCS) processing in order to capitalize on trends in the market.
- MAI's historical market orientation toward utility processing and scientific/engineering processing are slow or no-growth markets in batch but represent good markets in RCS. With WYLBUR and more RJE terminals installed at customer sites, MAI is poised to exploit these market segments.

EXHIBIT IV-4











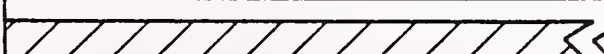
LOS ANGELES COMPUTER SERVICES* -
MARKET FORECAST BY MODE AND TYPE OF SERVICE

COMPUTER SERVICES		(\$ MILLION)						1979-1989 AAGR
MODE	TYPE	1979	1980	1981	1982	1983	1984	
REMOTE COMPUT- ING SERVICES	GENERAL BUSINESS	\$ 25	\$ 30	\$ 36	\$ 44	\$ 52	\$ 62	20%
	SCI. & ENG.	18	20	24	28	33	38	16
	IND. SPEC.	84	103	125	153	188	229	22
	UTILITY	40	47	57	68	81	96	20
SUBTOTAL		\$167	\$200	\$242	\$293	\$354	\$425	21%
BATCH PROCES- SING	GENERAL BUSINESS	39	44	49	55	62	71	13
	SCI. & ENG.	5	5	5	5	5	5	0
	IND. SPEC.	60	67	72	77	82	86	8
	UTILITY	19	20	20	21	21	21	2
SUBTOTAL		\$123	\$136	\$146	\$158	\$170	\$183	8%
FACILITIES MANAGEMENT		69	79	90	104	119	135	15%
TOTAL PROCESSING		\$359	\$415	\$478	\$555	\$643	\$743	16%

*5.2% OF U.S. MARKET

EXHIBIT IV-5

INCREMENTAL REVENUE GROWTH BY
MODE AND TYPE OF SERVICE, 1979-1984

COMPUTER SERVICE BY MODE AND TYPE*	AAGR 1979-1984 (PERCENT)	INCREMENTAL REVENUE GROWTH IN CURRENT DOLLARS (\$ MILLION)	LOS ANGELES MARKET (\$ MILLION)
INDUSTRY SPECIALTY - RCS	22%	 \$2,800	\$146
UTILITY - RCS	20	 1,100	57
INDUSTRY SPECIALTY - FM	15	 1,000	52
GENERAL BUSINESS - RCS	20	 700	36
GENERAL BUSINESS - BATCH	13	 600	31
INDUSTRY SPECIALTY - BATCH	8	 500	26
SCIENTIFIC AND EN- GINEERING - RCS	16	 400	21
UTILITY - BATCH	16	 300	16
SCIENTIFIC AND EN- GINEERING - FM	8	 50	3
UTILITY - BATCH	2	 50	3
SCIENTIFIC AND EN- GINEERING - BATCH	0	0	0
GENERAL BUSINESS - FM	0	0	0
TOTAL PROCESSING	16%	 \$7,500	\$391

\$0 1,000 2,000 3,000

*RCS = REMOTE COMPUTING SERVICE
FM = FACILITIES MANAGEMENT
AAGR = AVERAGE ANNUAL GROWTH RATE

- MAI can capture more of the RCS scientific/engineering market by selectively offering a few more of the CSG scientific/engineering packages.
- If MAI can derive about \$600,000 from scientific/engineering (batch and RCS) markets in 1980, it will have approximately 2% of that Los Angeles market segment.
- If MAI derives approximately \$2.5 million in revenues from utility processing (batch and RCS marketplace in 1980), it will have approximately 4% of that Los Angeles market segment.
- Exhibit IV-5 indicates that the largest and fastest-growing market segment of RCS industry-specialized services can only be exploited by MAI over the long term. This involves moving the specialized software with industry-specialized people to Los Angeles so they can sell and support these specialized industry market segments.
- The next-largest market segment in size and growth, shown in Exhibit IV-5, is the utility-RCS market. MAI is positioned well to exploit this market in that it has a good product and an established reputation.
- The third largest market, that for industry-specialized facilities management processing, might be considered an opportunistic market for MAI in Los Angeles. The Pierce Insurance work could be considered industry-specialized facilities management business. If other opportunities such as Pierce present themselves, MAI should be receptive.
- There appears to be very little opportunity in the general business segments. MAI has neither the software packages nor the people expertise to capitalize on these segments of the Los Angeles market.

V MAI/CSG SYNERGY

V MAI - CSG SYNERGY

A. BEACHHEAD IN U.S. FOR CSG SERVICES

- Exhibit V-1 shows the overall computer services market forecast by industry sector growing from over \$12 billion in 1980 to over \$24 billion in 1984. Exhibit IV-1 gives additional evidence.
- The Professional Services Group of CSG has a long-term opportunity in the U.S. for custom programming, professional services, turnkey business and minicomputer systems development.
- Exhibit IV-1 estimates the market for professional services in the U.S. at \$1.9 billion in 1980, growing to \$3.8 billion in 1984, for an average annual growth rate of 19%.
- The largest industry sectors for professional services are:
 - Federal government, with \$0.5 billion spent in 1980, growing to \$1 billion by 1984.
 - Discrete manufacturing, with \$300 million in 1980, growing to over \$600 million by 1984.

EXHIBIT V-1

COMPUTER SERVICES - MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

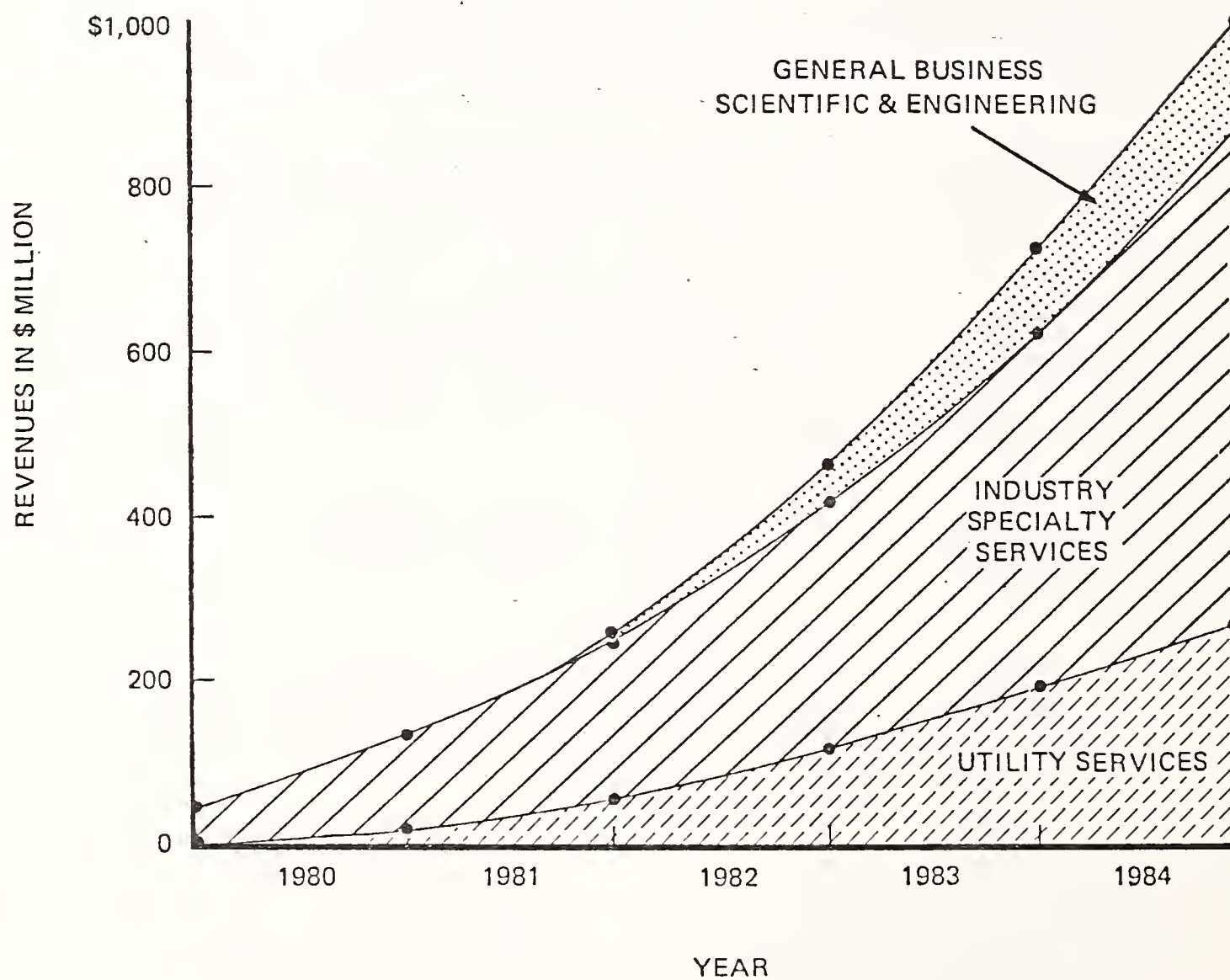
INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984 (\$ MILLION)						AAGR 1979- 1984
	1979	1980	1981	1982	1983	1984	
DISCRETE MANUFACTURING	\$ 1,337	\$ 1,635	\$ 1,985	\$ 2,410	\$ 2,941	\$ 3,595	22%
PROCESS MANUFACTURING	761	931	1,132	1,417	1,766	2,222	24
TRANSPORTATION	253	311	385	475	592	742	24
UTILITIES	396	468	545	644	764	913	18
BANKING AND FINANCE	1,907	2,208	2,557	2,957	3,425	3,969	16
INSURANCE	978	1,112	1,266	1,442	1,643	1,877	14
MEDICAL	570	648	756	887	1,049	1,245	17
EDUCATION	192	221	256	297	341	393	15
RETAIL	634	758	910	1,100	1,341	1,649	21
WHOLESALE	575	674	799	961	1,165	1,429	20
FEDERAL GOVERNMENT	1,279	1,520	1,825	2,184	2,618	3,132	20
STATE AND LOCAL GOVERNMENT	378	447	537	638	753	880	18
SERVICES	498	605	702	814	937	1,082	17
OTHER	420	504	598	721	873	1,066	20
TOTAL	\$10,178	\$12,042	\$14,253	\$16,947	\$20,208	\$24,194	19%

SOURCE: MAS ANNUAL REPORT, 1979

- State and local governments, with almost \$200 million in 1980, growing to almost \$350 million in 1984.
- Process manufacturing, with almost \$170 million in 1980, growing to over \$380 million in 1984.
- Turnkey minisystems offer an exciting opportunity during the next four years as well. The revenue derived from minicomputers installed at user sites is shown in Exhibit V-2.
- The Processing Services Group of CSG has an opportunity to process those customized systems developed by the Professional Services Group and also to offer proprietary software, particularly data base manipulating software.
- Exhibit V-3 shows the market forecast for on-line data base services by type of data base. This represents a 24% average annual growth rate.
- The networking of large-scale IBM systems in Canada with the IBM-compatible system in Los Angeles provides an interesting opportunity to load balance over different time zones.
- By networking the IBM-compatible computers, backup is also enhanced for on-line applications.
- The Industry Services Group of CSG has an exciting potential in the U.S. marketplace with its specialized services, particularly those appealing to the banking and financial community.
- Exhibit IV-4 shows the market forecast by industry sector, with the largest subsectors being banking/finance and insurance, two market sectors that the Industry Services Group has expertise and experience in serving.
- The TERM NOTES product, already proven in New York, should have good marketability next in Los Angeles and then throughout the U.S.

EXHIBIT V-2

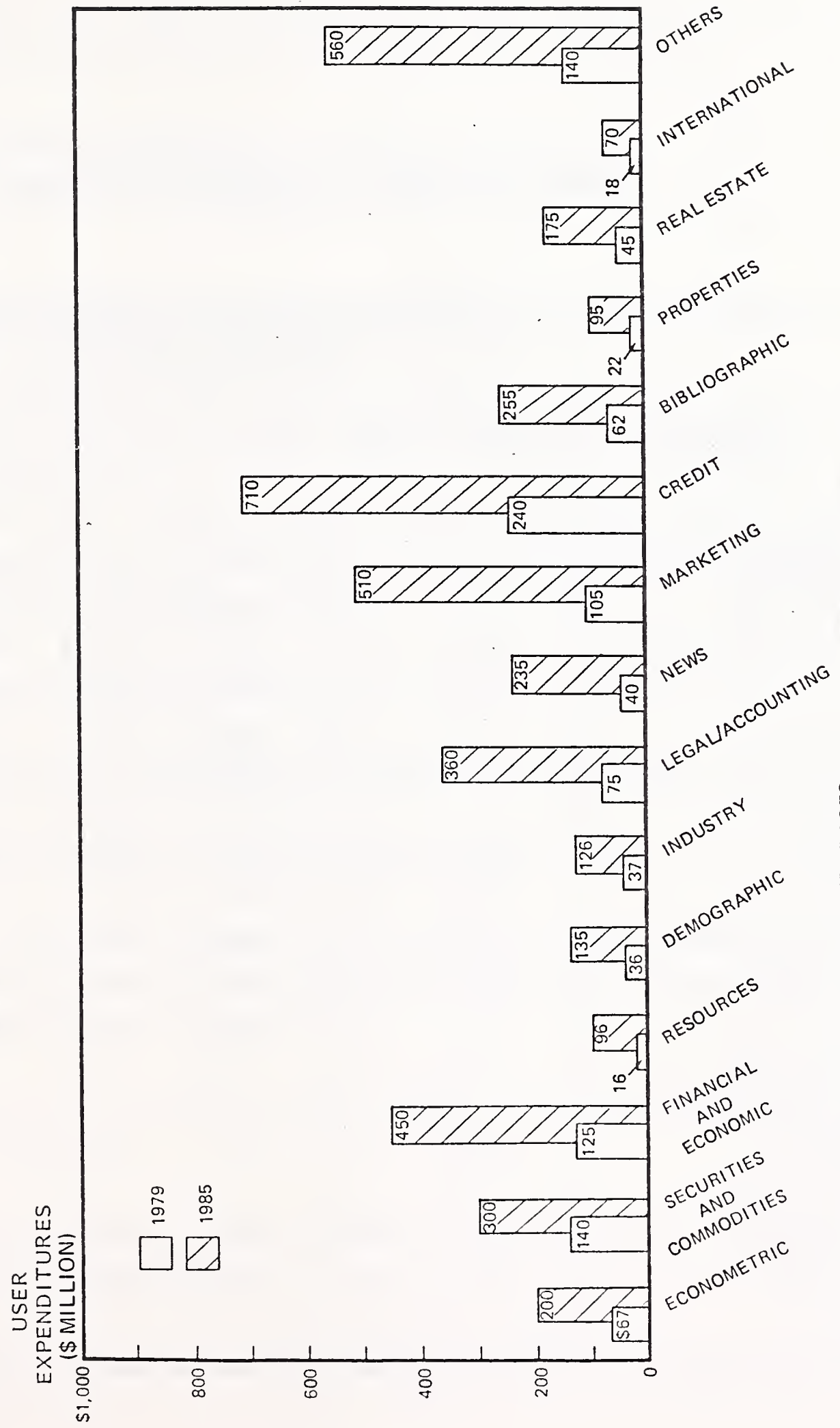
USER SITE HARDWARE SERVICES MARKET
FOR MINICOMPUTERS IN THE U.S.



SOURCE: USER SITE HARDWARE SERVICES

EXHIBIT V-3

MARKET FORECAST OF ON-LINE DATA BASE SERVICES BY DATA BASE SUBSECTOR, 1979-1985



SOURCE: MARKET OPPORTUNITIES FOR DATA BASES

EXHIBIT V-4

INDUSTRY SPECIALTY PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984 (\$ MILLION)						AAGR 1979- 1984
	1979	1980	1981	1982	1983	1984	
DISCRETE MANUFACTURING	\$ 261	\$ 315	\$ 375	\$ 440	\$ 510	\$ 602	18%
PROCESS MANUFACTURING	160	193	227	275	327	388	19
TRANSPORTATION	98	116	139	165	195	231	19
UTILITIES	63	78	87	107	132	163	21
BANKING AND FINANCE	1,241	1,446	1,684	1,962	2,286	2,669	16
INSURANCE	544	619	706	804	915	1,047	14
MEDICAL	420	471	542	627	730	846	15
EDUCATION	47	54	64	75	84	93	15
RETAIL	355	414	485	570	673	798	18
WHOLESALE	157	179	205	235	277	321	15
FEDERAL GOVERNMENT	21	26	32	39	48	59	23
STATE AND LOCAL GOVERNMENT	25	36	52	66	83	100	32
SERVICES	216	274	309	347	381	424	14
OTHER	120	146	165	192	220	249	16
TOTAL	\$3,728	\$4,367	\$5,072	\$5,904	\$6,861	\$7,990	16%

- Other products appealing to trust companies, mutual funds and brokerage operations should provide a long-term potential for these CSG services.

B. TRANSFER OF PACKAGES AND PEOPLE EXPERTISE TO MAI

- MAI needs people expertise coincident with the sharing of software packages.
- In order to be successful in promoting sales of new software that could be transferred from CSG, the local MAI people must learn the packages and then be able to support them.
- This sales and support effort can only succeed by initially sharing people resources between Canada and Los Angeles.
- It is very important to create the proper mood, meaning:
 - Acceptance by MAI people in Los Angeles of the CSG people.
 - Openness on the part of the CSG people as they visit MAI.
- In the past, CSG visitors assigned to provide technical assistance have been reluctant to leave materials and software, thus hindering the learning process and self-sufficiency of the MAI people.
- The most natural fit for the short term appears to be CSG's scientific and engineering packages.
 - MAI has considerable engineering skills in the form of Dr. Santee and his engineering assistants.
 - Additional trained engineers should be hired at MAI to supplement Dr. Santee's efforts, and these people should be given all the help, training

- and support necessary to become familiar with CSG's engineering programs.
- The most immediately salable engineering package in the short run is AMECO.
 - This program is in the process of being converted from the Canadian CDC equipment to MAI's AS/5 in Los Angeles. It would be desirable to get the assistance of Andre Palejs, the author of AMECO and a resident of Montreal.
 - While AMECO is being converted to the AS/5, all possible efforts should be made to sell the use of that package via the RJE terminal to the CDC machines in Canada.
- A number of additional packages may be considered for transfer from CSG to MAI as the people expertise is transferred and the knowledge assimilated.
- The structural programs currently available from Multiple Access, Inc. are:
 - STRESS III.
 - ANASYS.
 - PCA series of concrete analysis programs.
- The next series of engineering programs that could be moved include the mechanical engineering programs, especially:
 - BLAST, an energy analysis program.
 - DOE, another energy analysis program.

- The final series of programs that could be transferred consists of electrical engineering and petro-engineering programs.
 - CDEGS-5, because is it a CSG proprietary program.
 - COMPAID.
- An engineering specification library program - COMPSPEC - is available from the Construction Specification Institute. This program would nicely complement the CSG structural engineering program.
- TERM NOTES from MFS is clearly an exciting potential product. In the long term, people and some software modification would be needed to customize for the U.S. marketplace.
- FIPAC could also be considered in the distant future, as software and people expertise become available at MAI.

C. IMMEDIATE NEED FOR SOFTWARE TOOLS

- If MAI is going to enhance its offerings in the utility, RCS and batch markets, it needs some software tools currently available at CSG. These include:
 - Languages:
 - Assembler G (Waterloo).
 - FORTRAN IV (H Extended).
 - PL/I (Checkout).

- . WATBOL.
 - . WATFIVE.
 - Database managers:
 - . System 2000.
 - . TOTAL.
 - . IDMS.
 - Programmer tools:
 - . Debugging aids.
 - . Backup and restore programs.
 - . CALCOMP plotting routines.
 - . JCL generators.
 - . Source library update programs.
 - Technical assistance.
- MAI is preparing to install CICS on its AS/5 to support Pierce Insurance, which will be going on-line with LIFE/70.
 - The local MAI systems manager, Lou Keppel, and his assistant would greatly benefit from some technical assistance to prepare for the installation of CICS.

- Improperly installed, this software package could have a negative impact on the computer's response time and could affect the availability of capacity.
- Proper technical assistance for the installation of CICS is also necessary to respond to the requirements and expectations of MAI's largest customer, Pierce Insurance.

VI RECOMMENDED MANAGEMENT ACTION

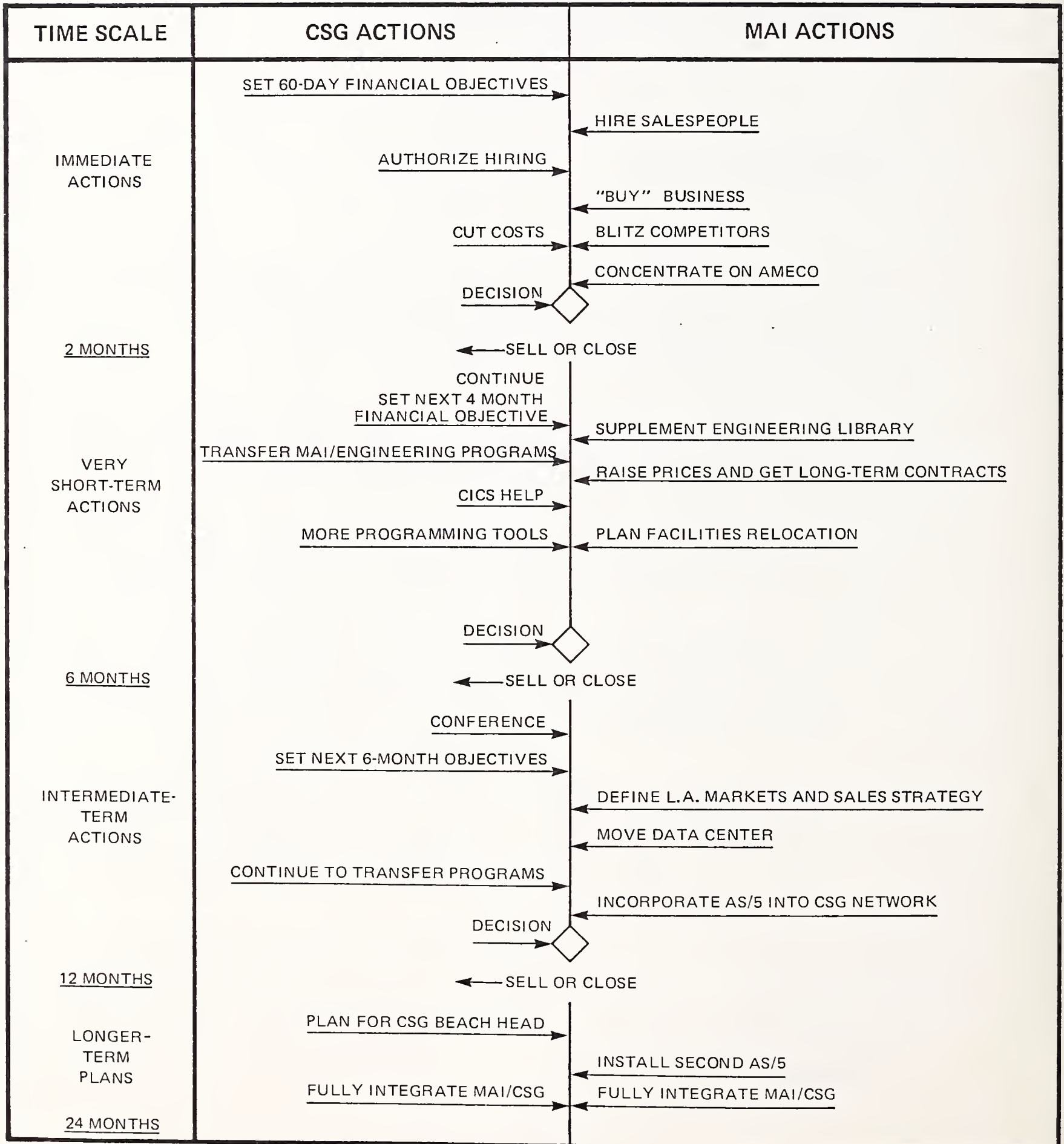
VI RECOMMENDED MANAGEMENT ACTION

A. DECISION FRAMEWORK

- INPUT recommends that CSG continue the MAI operations in Los Angeles. It is also recommended that mutually agreed-upon financial objectives be specified for specific timeframes. For example:
 - The \$30,000-per-month loss could be reduced to \$10,000 per month in 60 days by adding approximately \$20,000 of net new revenue.
 - By March 1981, an additional \$10,000 positive impact on the profit and loss statement will be realized when the two 360/65s are off lease.
 - By the beginning of 1982, the pretax profit should be close to the industry average of 7% on sales revenue by realizing more scientific/engineering revenues.
 - By the beginning of 1983, the pretax profit on revenue should be over 10% as MAI moves to exploit the industry-specialized services markets with products from CSG.
- The decision framework, as shown in Exhibit VI-1, calls for specific actions by MAI and CSG management personnel, with decision points every few months. The decision points to sell or close the operations will be dependent upon meeting the aforementioned financial objectives.

EXHIBIT VI-1

DECISION FRAMEWORK



- Although the short-term recommendations made by INPUT do not exploit the largest and fastest-growing segments described in Chapter IV, they do exploit the current people and customer assets at MAI. The momentum can be gradually turned toward the high-growth, largest market segments in the long term. This can be accomplished through a synergistic relationship between MAI and CSG.

B. IMMEDIATE ACTION - FIRST SIXTY DAYS

I. MARKETING AND TECHNICAL SUPPORT

- Hire two knowledgeable, experienced salespeople to sell raw machine time to fill up the unused capacity on the AS/5.
- Use headhunters in the L.A. area to find the salespeople. (Six experienced headhunters have been provided to MAI management.)
- Pay competitive base salaries with big commissions (about 10% of revenue), but only for the first year. Slide the percentage commission down as the customer becomes a longer-term customer. This encourages the salespeople to seek net new additional business while relying upon customer support and operations to hold existing customers.
- "Buy" business by offering deep discounts from standard prices. Most of the revenue dollars fall to the bottom line since there is little marginal cost in adding customers to a machine with unused capacity.
- Place ads in the computer industry papers in the Los Angeles Basin, and advertise in the Los Angeles Times for overflow, special project work and existing raw machine-time customers.

- Get DPMA or Computer Intelligence Inc. lists of all computer sites in the Los Angeles Basin. Canvas these possible prospects with direct mail and phone calls.
- Blitz competitors for new prospects, particularly the NASTRAN users of McAuto.
- Focus on engineering prospects, particularly in the structural engineering field, by getting a list of 125 structural engineering firms in Los Angeles. Also develop a direct mail campaign to the over 200 consulting engineers in Los Angeles, seeking their attendance at seminars.
- Concentrate on AMECO. Complete the AMECO conversion to the AS/5 by:
 - Getting help from the author.
 - QC-ing all changes.
 - Documenting all changes to the program.
 - Hiring recently graduated engineers for market support, training and nominal conversion activity.
- Take advantage of a unique opportunity in Los Angeles with the Bunker Hill Redevelopment Project. This project is being developed by a Canadian firm using a Canadian architect, which should be receptive to using the CDC engineering programs in Canada via an RJE terminal in Los Angeles.

2. OPERATIONS AND FINANCIAL

- Improve uptime by:
 - Keeping a strict log book on any downtime and by investigating the causes of downtime.

- Instituting regular preventive maintenance.
- Coordinating the many field engineering organizations that work on their variety of equipment in the computer room to establish responsibility for repair.
- Measuring field engineering efficiency (mean time to respond and mean time to repair).
- Study the feasibility of installing electrical power line conditioners or rectifiers. This should prevent electrical power surges, which have hurt machine reliability in the past.
- Improve the security in the computer room by locking doors and cleaning up the computer room.
- Prepare standard reports (preferably in the format of CSG) for:
 - Revenue by customer by type of service.
 - Expense reports by department.
 - Computer reliability versus uptime objectives.
 - Used and unused computer capacity.
 - Actual revenue and profit versus financial objectives.
- Go through cost-cutting exercises to eliminate any unnecessary expenses.

C. VERY SHORT-TERM ACTIONS - NEXT TWO TO SIX MONTHS

I. MARKETING AND TECHNICAL SUPPORT

- Continue series of seminars in WYLBUR and AMECO for customers and prospects.
- Publish articles in the Engineering News Record on the power of AMECO, and use reference selling from current AMECO and NASTRAN users.
- Plan to implement an engineering library with selected CSG engineering programs from Multiple Access, including: ANASYS, BLAST, DOE II, STRESS III.
- Canvas "big eight" CPA firms for possible running of internal time and billing systems. The following firms have either previously run or now have MVS-based systems for internal time and billing:
 - Peat, Marwick and Mitchell.
 - Price-Waterhouse.
 - Deloit, Haskins and Sells.
 - Arthur Andersen.
- Prepare attractive sales literature for engineering programs and programmer tools.
- Attempt to get all 30-day contracts on longer-term contracts. Raise prices and then offer to defer the price increase if a longer-term contract is signed. This must be done on a customer-by-customer basis so as not to lose any customers.

2. OPERATIONS AND FINANCIAL

- Begin to review plans to move the facility, as the lease expires May 1981. The current building on Westwood is not a good choice for continued data center operation because of poor customer access, poor security and poor layout. It is also in a General Telephone area, which is less desirable than a Pacific Telephone area.
- Consider new facilities in the airport vicinity, Santa Monica or other first-story, West L.A., new industrial park locations. The Panorama City location does not appear to be a good facility since most of the customers are in West L.A. or Orange County.
- Study the teleprocessing services to consolidate foreign exchange and multiplexer lines with a reconfigured controller. This should result in better service at lower costs. Also, access to the CDC center in Canada must be made better for both high-speed RJE access and low-speed access through Telenet. Consider using TYMNET in place of Telenet.
- Experiment with a new service offering IBM 3800 laser printing by spooling files over the RJE line to the Canadian center.
- Revise the AS/5 charging algorithm by raising the I/O charges and generally raising prices 5% to 10% for existing customers where the contract permits.
- Carefully prepare for the upcoming CICS installation by getting CSG technical help. Improper installation of CICS could cut the available capacity on the AS/5 and with it future revenue opportunities.
- Begin moving some CSG programming tools to MAI, such as: debugging aids, new assemblers, new compilers and library maintenance routines. (See Chapter V, Section C.)

D. INTERMEDIATE-TERM ACTION - SIX TO TWELVE MONTHS

1. MARKETING AND TECHNICAL SUPPORT

- Define more precisely which specific markets and industry sectors MAI can address given the limited people skills and limited dollar investment. (Refer to Chapter IV.)
- Quantify the available Los Angeles marketplace in terms of dollar revenue and number of prospects for those specific markets MAI will address. Identify named prospects, write standard sales presentations, set prices and establish call standards. Then sell!
- Marketing effectiveness should go up since salespeople will not have to do the market planning (who to call on, what to say, what to sell and how to sell it) during the sales call, as is now being done.

2. OPERATIONS AND FINANCIAL

- Move the center and consolidate into one building. Release the two 360/65s and place those customers with another DOS service bureau or convert them to the AS/5.
- Continue to transfer programming tools and technical computer expertise from CSG to MAI.
- Incorporate the AS/5 into the CSG teleprocessing network for possible load sharing and capacity balancing.

E. LONG-TERM PLANS - AFTER TWELVE MONTHS

1. IF FINANCIAL OBJECTIVES ARE MET

- Previously agreed-upon financial objectives must be met at each decision point in the decision framework.
- Then begin transferring people and packages for the establishment of the CSG beachhead in the U.S. marketplace. (See Chapter V, Sections A and B.)
- Consider moving another AS/5 into the MAI center in Los Angeles.
 - The current AS/5 should be nearing fully loaded condition.
 - The new one will provide backup for those on-line applications on the current AS/5.
 - It will also provide possible capacity for use by Cogito.

2. IF FINANCIAL OBJECTIVES ARE NOT MET

- Move AS/5 to Canada or sell it.
- Transfer MAI to Processing Services Group, where similar IBM services may be provided from the Canadian center.
- Consider selling MAI or closing the operations in Los Angeles.

APPENDIX A: COMPANY HIGHLIGHTS OF
COMPETITIVE FIRMS

COMPANY HIGHLIGHT/LITTON MELLONICS

COMPANY HIGHLIGHT

LITTON MELLONICS
1001 W. Maude Avenue
Sunnyvale, CA 94086
(408) 245-0795

Richard W. Baker, President
Division of Litton Industries
Total Employees: 550
Total Revenues, FYE 7/31/80:
\$30,000,000
Non-Captive Revenues: \$19,000,000

THE COMPANY

- Litton Mellonics was formed in 1963 by Litton Industries after the acquisition of Mellonics Inc., a small software development company in Sunnyvale (CA). Litton Mellonics currently provides consulting services for government and commercial clients and offers processing and litigation support services.
- Total revenues were \$30 million in FY 1980, a 25% increase over FY 1979 revenues of \$24 million. A five-year summary of its captive and non-captive revenues follows:

LITTON MELLONICS
FIVE-YEAR FINANCIAL SUMMARY
(\$ Thousands, Numbers are Approximates)

ITEM \ FISCAL YEAR	7/31/80	7/31/79	7/31/78	7/31/77	7/31/76
Non-Captive Revenues	\$19,000	\$15,000	\$ 9,000	\$ 8,000	\$ 7,000
• Percent of total	63%	63%	47%	53%	50%
Captive Revenues	\$11,000	\$ 9,000	\$10,000	\$ 7,000	\$ 7,000
• Percent of total	37%	37%	53%	47%	50%
Total Revenues	\$30,000	\$24,000	\$19,000	\$15,000	\$14,000

- Litton Mellonics employs about 550 personnel, 150 in the Washington (DC) area and 400 at various California locations.
- Major competitors for government-related software development contracts are Computer Sciences Corporation and System Development Corporation. Competition for processing services comes from a number of regional firms as well as several of the large remote computing vendors.

COMPANY HIGHLIGHT/LITTON MELLONICS

KEY PRODUCTS AND SERVICES

- An approximate breakdown of Litton Mellonics FY 1980 revenues follows:

	<u>Percent of Total</u>	<u>Revenue Value (\$ Million)</u>
- Software development contracts	27%	\$ 8
- Processing services		
• Captive	37	11
• Non-captive	23	7
- Litigation support	13	4
	<hr/> 100%	<hr/> \$30

- Litton Mellonics' areas of expertise within its professional services group encompass systems engineering, systems modeling and simulation, command and control, feasibility studies, management information systems and the development of real-time systems.
 - Examples of contracts held by the company are:
 - Real-time satellite command and control system for the Air Force.
 - Space studies for the Space Defense Operations Center.
 - Global Positioning System for the Air Force.
 - Development of point-of-sale systems.
 - Behavioral research and development of training methodologies for the U.S. Army.
 - Management system support for the U.S. Navy.
- Processing services are provided from the Mellonics Information Center (MIC) in Canoga Park (CA). Initially established in 1967 to provide timesharing services to Litton companies in Southern California, it has been offering services to outside organizations since the early 1970s.
 - A profile of software available on the network is presented in Exhibit A. Although the majority of software offered is systems-oriented, specific applications software is being considered.
- Litton Mellonics began providing litigation support services in 1978.

EXHIBIT A

LITTON MELLONICS
NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – IBM 3033, MVS • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – APL – ASSEMBLER – BASIC – CAPEX OPTIMIZER – COBOL – FORTRAN – PL/1 – RPG II; 360 • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – RAMIS; IMS INTERFACE – IMS/VS; DB DC; DL/1; ADF – CICS – DL/L 260 DL/1 INTERFACE – TOTAL – PANVALET 	<ul style="list-style-type: none"> • STATISTICAL <ul style="list-style-type: none"> – SSP – SPSS – SAS – BMDP • MODELING <ul style="list-style-type: none"> – CSMP – FORESIGHT – GPSS V • PLOTTING <ul style="list-style-type: none"> – VERSATEC • SPECIAL APPLICATIONS <ul style="list-style-type: none"> – APT/AC (NUMERICAL CONTROL) – BTS II (BATCH TERMINAL SIMULATOR) – DUO/DOS – SIMPL/1 – FAST (CRITICAL PATH) – WINDFALL PROFITS TAX

COMPANY HIGHLIGHT/LITTON MELLONICS

- Legal services are provided to commercial and government clients from offices in Washington (DC) and Los Angeles.
- In addition to providing clerical and paralegal personnel for data gathering and cataloging, the company also provides processing services for:
 - . On-line document retrieval.
 - . On-line subject matter thesaurus.
 - . On-line text editing.
 - . Printing directories and reports.
 - . Key-word-in-context indices.
 - . Computer-output-microfilm services.
 - . Remote batch and remote job entry processing.

INDUSTRY MARKETS Approximately 30% of Litton Mellonics' revenues is derived from the federal government. The remaining 70% is derived from clients in manufacturing, legal services and other various industries.

GEOGRAPHIC MARKETS

- Currently one hundred percent of the company's revenues come from the U.S., almost exclusively from clients in California and the Washington (DC) area. The company has, however, performed extensive work for foreign clients.
- Offices are maintained in Washington (DC); Crystal City (VA); Canoga Park, San Diego and Camarillo (CA); and Columbus (GA).

COMPUTER HARDWARE

- The Litton Mellonics data center in Canoga Park has two IBM 3033s, operating under MVS.
- Clients outside the Pacific region access the network via leased lines. Internal clients use Litton's Telenet communications system.

COMPANY HIGHLIGHT

OPTIMUM SYSTEMS, INC.
2801 Northwestern Parkway
Santa Clara, CA 95051
(408) 987-4444

Ramon V. Jarrell, Vice Chairman
Of The Board
Private Corporation
Total Employees: 1,098
Total Revenues, Fiscal Year End
7/31/79: \$31.3 million

THE COMPANY

- Optimum Systems Incorporated (OSI) was founded in 1967 to provide computerized sport player selection and municipal information systems. It is privately held by the Murchison family of Dallas, TX. While OSI continues to operate a player selection system for the Dallas Cowboys and several hockey teams, it is now primarily a remote computer service vendor providing processing services for Federal, State and local governments, manufacturing firms, health care organizations, commercial banks and equipment dealers.
- Optimum Systems Incorporated ended fiscal year 1979 with revenues of \$31.3 million, a 14% increase over 1978 revenues of \$27.5 million. OSI gross revenues for the last two years and the estimated revenue for the current fiscal year are listed below:

OSI GROSS REVENUES 1978-1980 (FYE 7/31)

FISCAL YEAR ITEM	1980	1979	1978
Revenues	\$38.3 M	\$31.3 M	\$27.5 M
Percent increase from previous year	22%	14%	NA

- The corporate structure of OSI includes three divisions and two subsidiaries.
 - The Computer Services Division markets all OSI services with the exception of those for health care and banking, and Federal Government contracts.
 - The Health Care Division provides claims processing and a medical utilization review system.
 - The East Coast Division primarily handles facilities management contracts with the Federal Government.

- Banking Systems, Inc. (BSI), a wholly-owned OSI subsidiary, primarily offers an on-line software system for financial institutions, using a TANDEM minicomputer.
- E.B.S. Data Processing, Inc., a 90% owned subsidiary of OSI offers batch processing services and markets an equipment dealer system and an in-store pharmacy system.

KEY PRODUCTS AND SERVICES

- OSI derives a large percentage of its revenue from processing services. Some consulting is performed, but this is primarily for application development in conjunction with network services. Turnkey sales will not have an impact on revenues until next year.
- OSI offers interactive and remote batch computing services from its data centers in Santa Clara, CA and Rockville, MD. A complete listing of applications available on the OSI network is contained in Exhibit A.
 - Applications added to OSI's network in 1979 include:
 - Process refinery package for petrochemical manufacturers. This simulation and modeling package is for use in the designing of a refinery to save energy costs in the actual operation of the refinery. OSI has acquired exclusive marketing rights to this package. Management anticipates the product has strong market potential.
 - The Builders Information and Accounting System (BIAS) is an accounting and management information system designed for the needs of the diversified building industry, real estate construction, development, and management companies.
 - Developed by K. Leventhal and Company, it is marketed by Optimum Systems to large scale home builders (at least 200 homes per year). The system includes accounts payable, job cost, general ledger, and data entry capabilities.
- In 1970, OSI introduced an on-line, real time version of the Generalized Municipal Information System (GEMUNIS). In 1979, GEMUNIS became available as a turnkey system based on a Hewlett-Packard 3000 minicomputer with the IMAGE-3000 data base management system.
 - GEMUNIS/3000's targeted market are cities which have a population of 20,000 to 125,000.
 - OSI anticipates an average system will cost \$100,000.
 - There is one prototype installation of GEMUNIS/3000 in operation serving 20 cities in Hennepin County, Minnesota.
 - OSI is marketing this product nationwide and claims there is no competition at this time for a municipal turnkey system.

EXHIBIT A

OSI

APPLICATIONS AVAILABLE ON PROCESSING SERVICE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – IBM 370/3033 – VM/CMS – CICS – TSO (AVAILABLE AT ROCKVILLE, MD DATA CENTER) – SUPERWYLBUR • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – COBOL – FORTRAN – PL/1 – ALGOL – WATFIV – SIMSCRIPT – RPG • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – IMS – MARK IV – EASYTRIEVE – DYL 260 – RSVP • DATA BASES AVAILABLE <ul style="list-style-type: none"> – PMSIV – PROJECT/2 – SYSTEM 2000 • ACCOUNTING/FINANCIAL APPLICATIONS/ TOOLS <ul style="list-style-type: none"> – GENERAL LEDGER – ACCOUNTS RECEIVABLE – ACCOUNTS PAYABLE – AUTOTAB (FINANCIAL PLANNING AND FORECASTING) – BIAS (FOR BUILDING INDUSTRY) 	<ul style="list-style-type: none"> • SIMULATION/STATISTICAL <ul style="list-style-type: none"> – GPSS – SIMSCRIPT 11.5 – BMDP – MINITAB – SAS – SPSS – ASTAP • ENGINEERING/SCIENTIFIC <ul style="list-style-type: none"> – HEC-1 AND 2 (WATER CONTROL) – PSUICES/STRUDL (STRUCTURAL ANALYSIS) – SAP (STRUCTURAL ANALYSIS) – PS-01 • MUNICIPAL INFORMATION (GEMUNIS) <ul style="list-style-type: none"> – FINANCIAL – PAYROLL/PERSONNEL – BUSINESS LICENSE – UTILITY BILLING – EQUIPMENT CONTROL – ANIMAL LICENSE SYSTEM • MANUFACTURING INFORMATION (MICS) <ul style="list-style-type: none"> – BILL OF MATERIAL – INVENTORY CONTROL – MATERIAL REQUIREMENTS PLANNING – PURCHASING • LEGAL <ul style="list-style-type: none"> – OSI/LAW (DOCUMENT RETRIEVAL) – PLEADING PREPARATION AND SEARCH – KWIC (KEY WORD IN TEXT) • OTHER <ul style="list-style-type: none"> – DOCU/TEXT (SYSTEMS DOCUMENTATION) – UTPS (URBAN TRANSPORTATION PLANNING) – PSRO (PROFESSIONAL STANDARDS REVIEW) – MEDICARE CLAIMS PROCESSING – NATIONAL SPORTS TEAMS PLAYER SELECTION

COMPANY HIGHLIGHT/OPTIMUM SYSTEMS, INC.

- OSI's Health Care Division has two distinct markets: Claims Processing and Medical/Utilization Review Systems. Claims Processing clients include Arkansas Blue Cross/Blue Shield, Connecticut General, Blue Cross/Blue Shield of Minnesota and Aetna Life and Casualty, for which OSI provides processing for Medicare, Part B claims. The Division is a leader in PSRO data processing, and included among its clients are the Chicago Foundation for Medical Care and Alabama Medical Review Organization.
- OSI provides facilities management support to the Federal Government from its Rockville, MD branch. Facilities management contracts currently held are with the Department of Labor, the Department of Energy, and the Department of Commerce.
 - OSI anticipates providing commercial facility management services as well as systems management services with the IBM 4300 series computer.
- Through its subsidiary Banking Systems, Inc. (BSI), OSI offers an on-line transaction processing system via TANDEM minicomputers to commercial banks.
 - BSI and 11 of the top 200 U.S. banks organized a project to design and develop a comprehensive set of software to support on-line bank processing via a TANDEM minicomputer. The standalone capabilities include:
 - Account inquiry/memo post.
 - Customer information file.
 - Data entry.
 - Telephone bill paying.
 - Signature display.
 - Remote banking (EFT/POS).
 - With data centers in Texas and Oklahoma BSI management claims to offer a full range of banking services to smaller banks.
- OSI is jointly marketing the PHACTS Pharmacy System with its subsidiary E.B.S. Data Processing, Inc.
 - The PHACTS system uses a Cincinnati Milicron small business computer and is an in-store system.
 - Applications provided by PHACTS include printing of prescription labels and receipts, maintaining a profile of a patient's prescriptions, drug pricing, creation of third party invoices, and provides a number of in-store reports for management purposes.
 - When sold as a turnkey system the price is \$25,000. There is an additional cost if the system is to be tied to the OSI network.
- Also available from E.B.S. Data Processing, Inc. and introduced in 1979 is a Property Management System based on a Texas Instrument microprocessor.

COMPANY HIGHLIGHT/OPTIMUM SYSTEMS, INC.

- This system is designed to track apartment complex and shopping center rentals. It includes general ledger and billing applications.
- The system, which includes a microprocessor and applications software, sells for \$15,000. The majority of the marketing for this product is handled by mail.

INDUSTRY MARKETS The industries from which OSI derives its revenues include: manufacturing, banking and finance, insurance, government (both federal and local), medical/hospital, legal, sports teams, equipment dealers, and engineering firms.

GEOGRAPHIC MARKETS OSI markets its services nationwide. The majority of clients are concentrated near branch offices in the following cities: San Francisco, Palo Alto, El Segundo, Newport Beach (CA); Englewood (CO); Chicago (IL); Washington, DC; Rockville (MD); Dallas, Houston, Victoria (TX); Tulsa, Oklahoma City (OK); and Minneapolis (MN).

COMPUTER HARDWARE AND SOFTWARE

- OSI's network consists of IN-WATS, leased lines and Tymnet. There is local access from the metropolitan area of the cities in which OSI has branch offices.
- The Santa Clara data center's equipment consists of:
 - One IBM 3033 operating in an MVS environment.
 - One IBM System 370/165 operating in a VM/CMS environment.
- The Rockville, MD facility contains:
 - One IBM 3033 operating under MVS.
 - One IBM System 370/158 operating under MVS.
- OSI has 20 IBM 4331s on order. Plans are to place the systems in branch offices to facilitate distributed data processing.

COMPANY HIGHLIGHT

INFORMATION SYSTEMS DESIGN, INC.
3205 Coronado Drive
Santa Clara, CA 95051
(408) 249-8100

George T. Steely, Jr., President
Private corporation
Total employees: 140
Total revenues fiscal year end:
6/30/78: \$5,500,000*

THE COMPANY

- Information Systems Design, Inc. (ISD) was founded in 1966 as a California Corporation. Its principal business is remote computing services.
- During June 1978, ISD purchased CAD Edison, Inc. At the time of purchase CAD Edison generated revenues of \$400,000 annually by providing wire-wrap machine instructions and wire-list consulting.
- ISD employees are distributed by function as follows:

Marketing sales	19
Software services/customer support	42
Computer operations	54
General and administrative	<u>25</u>
	140

KEY PRODUCTS AND SERVICES

- Processing services generated 95% and other computer services generated 5% of fiscal 1978 revenues.
 - Processing services for fiscal 1978 were comprised of:
 - 95% remote computing services
 - 5% batch services
 - Remote computing services were generated by mode as follows:
 - Remote batch 65%
 - Interactive 35%
 - 100%
 - Other computer services, such as software products, professional services and turnkey systems, generated 5% of fiscal 1978 revenues.
- ISD has approximately 20 minicomputer systems installed at client locations. Digital Equipment Corp., Data General, and Harris are the principal manufacturers.

*INPUT estimate

October 1978

COMPANY HIGHLIGHT/INFORMATION SYSTEMS DESIGN, INC.

- ISD's program library includes the following:
 - Data base management systems:
 - System 2000
 - OMNIDATA
 - Electrical engineering applications:
 - ASPEC, which performs electronic circulate simulation
 - CAS (Computer Aided Design System)
 - ISD-SPICE
 - COD (Constrained Optimal Design System)
 - Structural engineering applications:
 - SPAR, which is a finite element stress analysis package
 - ANSYS (ANalysis SYStem)
 - MARC
 - NASTRAN (NAsa STRuctural ANalysis)
 - NIFDI
 - NISA (Numerically Integrated elements for System Analysis)
 - PATCHES III
 - ICES/STRUDL-II (Integrated Civil Engineering System/STRUctural Design Language)
 - Graphics applications:
 - DISPLA
 - SURFACE DISPLAY LIBRARY (SDL)
 - TEKTRONIX PLOT-10
 - Linear programming and optimization
 - Mathematical and statistical applications
 - Programming-calculus
 - System simulation

APPLICATIONS Revenues are generated by applications types as follows:

Scientific and engineering	85%
Industry specialty (for electronics industry and structural engineers)	10
General business	<u>5</u>
	100%

COMPANY HIGHLIGHT/INFORMATION SYSTEMS DESIGN, INC.

INDUSTRY MARKETS Discrete manufacturing generated the majority of revenues for fiscal 1978 as shown below:

Discrete manufacturing		70%
Government		7
Federal	5	
State and local	2	
Other/consulting engineers		<u>23</u>
		100%

GEOGRAPHIC MARKETS

- Revenues for fiscal 1978 were distributed by region of the U.S. as follows:

Pacific	90%
Middle Atlantic	5
South Atlantic	<u>5</u>
	100%

- Branch offices are located in the following California cities: San Francisco, Berkeley, El Segundo, Santa Ana, and Lafayette. Recently, ISD has also opened an office in Houston, TX.

COMPUTER HARDWARE AND SOFTWARE

- Five UNIVAC 1108 CPUs, running under EXEC 8, and one UNIVAC 1100/82, also running under EXEC 8, are used for providing computer services.
- Turnkey systems employ DEC PDP-11/34, Harris 1600, and Data General equipment.
- ISD subscribes to Tymshare's data communications network, TYMNET.

COMPANY HIGHLIGHT

UNITED INFORMATION SYSTEMS GROUP

2525 Washington Street
Kansas City, MO 64108
(816) 221-9700

G. Jack Lorenz, President
Subsidiary of United
Telecommunications, Inc.
Total Employees: 1,910
Revenues, Fiscal Year End 12/31/79:
\$138,446,000

THE COMPANY

- The oldest member of the United Information Systems Group is United Computing Systems (UCS), formed in 1967 by its parent, United Telecommunications, Inc. United Telecommunications is also the parent company of United Telephone Systems, the second largest independent (non-Bell) telephone company in the nation.
- In March 1980, United Telecommunications formed the United Information Systems (UIS) Group from UCS and other recently acquired computer services firms. The change in name coincided with United Telecommunication's announcement of its intention to make a major commitment to support its non-telephone subsidiary operations: UIS and the newly formed United Communications Systems Group. Communications Systems was formed to direct competitive telecommunication services and distribution activities.
- Since 1967, United Telecommunications has acquired nine companies to build its computer services organization. Several major acquisitions completed during the last two years have increased UIS's revenues significantly:
 - Calma Company of Sunnyvale (CA) was acquired in September 1978. Calma reported revenues of approximately \$17 million at the end of 1977. The company was acquired for 881,490 shares of United Telecommunications stock, a value of approximately \$17 million.
 - On-Line Systems, Inc., Pittsburgh (PA) was acquired in November 1979. On-Line reported revenues of \$29,249,683 and net earnings of \$2,188,501, or \$1.60 per share, for FY ended April 30, 1979. United Telecommunications acquired On-Line for approximately 1.72 million shares of common stock, valued at about \$35 million.
 - Utility Data Management Services (UDMS), a former division of Intel, was acquired in January 1980. Utility Data, with revenues of \$12.5 million in 1978, provides scientific and engineering processing services. UDMS was acquired in a purchase transaction valued at approximately \$12 million.

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- The majority of United's acquisitions have been accounted for on a pooling of interest basis. As such, the company's financial statements are constantly being restated. United's acquisition strategy has placed UIS in a leading position as a major supplier of computer services within a relatively short time.
- In 1967, UCS reported revenues of \$0.7 million. By 1979, revenues had reached \$138.4 million, reflecting an average compounded growth rate of 55% per year during a 12 year period.
- With the inclusion of Utility Data Management Services' revenues and growth in other divisional activities, INPUT estimates UIS's revenues will be over \$180 million by the end of 1980.
- A five year summary of UIS revenues follows:

UIS
FIVE YEAR FINANCIAL SUMMARY (RESTATED)
(\$ Thousands)

ITEM \ FISCAL YEAR	1979	1978	1977	1976	1975
Total Revenue	\$138,446	\$103,397	\$ 77,249	\$ 59,040	\$ 46,455
• Percent increase from previous year	34%	34%	31%	27%	36%
Net Income	\$ 7,662	\$ 7,156	\$ 7,627	\$ 4,452	\$ 1,199
• Percent increase (decrease) from previous year	7%	(6%)	71%	271%	(23%)

- United Information Systems Group consists of five operating companies.
- United Computing Systems is organized into three divisional activities:
 - Network Information Services (NIS), responsible for sales and marketing of remote computing services in North America.
 - Business Information Products develops and markets accounting, financial, and management control software products.
 - Utility Data Management Systems provides scientific and engineering remote computing services.
- On-Line Systems provides general purpose remote computing and batch processing (primarily file management and reporting) to commercial and government clients. The acquisition of On-Line Systems provides UIS customers with more general business applications than are provided by the NIS Division.

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- United Computing International coordinates all international business outside North America, including London United Computing Systems (formerly London University Computing Services) and the international business of On-Line Systems.
- UNINET provides networking services to all UIS operating companies, both domestic and international. Over 200 cities across the U.S., Canada, and Europe are provided with toll free access to its data centers.
- Calma is a leading supplier of computer design and computer aided manufacturing (CAD/CAM) turnkey systems for printed and integrated circuit design, mechanical design, drafting, and mapping.
- UIS's 1,910 employees (as of July 31, 1979) were segmented as follows:
 - Marketing sales and technical support 51%
 - Computer operations/R&D 39
 - General and administrative 10
 - 100%

KEY PRODUCTS AND SERVICES

- INPUT estimates UIS derived 67% of its 1979 revenues from processing services, 30% from graphic turnkey systems, and 3% from software products. Less than 2% of UIS's revenues were derived from its parent organization.
- UCS's Network Information Services (NIS) Division provides remote computing services to over 2,000 companies in a variety of industries. A profile of the services provided by this NIS Division follows:

	Percent Contribution To <u>Total Revenue</u>
Computer Services	
. Remote Computing	99%
. Professional Services	<u>1</u>
	100%
Type of Remote Computing	
. Interactive	76%
. Remote Batch	<u>24</u>
	100%
Applications Used on the Network	
. Scientific and Engineering	60%
. Utility	30
. General Business	<u>10</u>
	100%

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- The principal NIS product is APEX, the timesharing operating environment of UCS's network. Two complexes of CDC computers and a CRAY-1 computer can be accessed from 200 cities in the U.S., Canada, and Europe. Remote batch services are available throughout the country via inbound WATS and regional concentrators.
- The APEX system library contains over 400 programs for generalized computing. A profile of the major applications offered on the NIS network is presented in Exhibit A.
- Major products used on the NIS network include:
 - FORESIGHT, a business planning language used for financial modeling and management reports. It was developed by Foresight Systems, Inc., a UIS subsidiary.
 - Engineering and Scientific applications emphasized are structural analysis (ANSYS, NASTRAN, GIFTS, SPACE 4, MARC) and pipe flexibility programs (AUTOFLEX, DYNAFLEX, TRIFLEX, ADLPIPE). Other specialty products used are:
 - SACM, a program for analyzing three-dimensional surfaces and producing contour maps.
 - CHEMSHARE, a collection of programs for the design and simulation of refineries.
 - ECUBE, an energy analysis program from the American Gas Association.
 - POGOS (Power Generation and Optimization System), a problem oriented language that simulates the thermal operating characteristics of a complete steam turbine power plant cycle by using commands that describe key hardware components and operating conditions.
- UCS's Business Information Products (BIP) Division is a consolidation of two previous acquisitions: Foresight Systems, Inc., and Infonational, Inc. BIP markets and supports three principal products:
 - FORESIGHT, the business planning language previously described.
 - FORETAX, designed for federal, state, municipal, and franchise income tax reporting, planning and consolidation, and ADR guidelines for asset depreciation calculations.
 - INFONATIONAL, a system of general ledger, accounts receivable, accounts payable, and fixed assets, developed by Infonational, Inc.

EXHIBIT A

UCS - NIS DIVISION
NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – CDC CYBER 170, 6600 (APEX/SCOPE) – CRAY-1 (COS) • PROGRAMMING LANGUAGE SUPPORTED <ul style="list-style-type: none"> – APL – BASIC – COBOL – COMPASS – FORTRAN – PASCAL – SUPER BASIC – SUPER FORTRAN • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – INTERACTIVE FILE MANAGER (IFM) – INFORM – SEED – SYSTEM 2000 – TOTAL • GRAPHICS <ul style="list-style-type: none"> – UNIGRAPH – DISSPLA – CALMAGRAPHIC INTERACTIVE (CGI) • PROJECT MANAGEMENT <ul style="list-style-type: none"> – TOPMAN (TRACKING) – LESTIME AND TIMETABLE (CPM) • FINANCIAL APPLICATIONS/TOOLS <ul style="list-style-type: none"> – MANAGE (PORTFOLIO MANAGEMENT) – FORESIGHT (FINANCIAL ANALYSIS) • DATA BASES <ul style="list-style-type: none"> – CENSUS – COMPUSTAT – TELSTAT (SECURITY PRICING) – INSIGHT (ECONOMETRIC DATA) 	<ul style="list-style-type: none"> • STRUCTURAL ANALYSIS <ul style="list-style-type: none"> – ANSYS – NASTRAN – GIFTS – SPACE 4 – MARC • MATHEMATICAL/STATISTICAL <ul style="list-style-type: none"> – IMSL LIBRARY – SPSS – PROSE (CALCULUS LANGUAGE) – ALPS (LINEAR PROGRAMMING) – UNISTAT • KEY SCIENTIFIC AND ENGINEERING PRODUCTS <ul style="list-style-type: none"> – COMPACT (CIRCUIT DESIGN) – PIPING ANALYSIS (AUTOFLEX, DYNAFLEX, TRIFLEX, ADLPIPE) – SACM (MAPPING) – CHEMSHARE (REFINERY SIMULATION) – ECUBE (ENERGY ANALYSIS) – POGOS (POWER PLANT SIMULATION) • ENGINEERING (NUMEROUS PROGRAMS) <ul style="list-style-type: none"> – CIVIL – MECHANICAL – ELECTRICAL – CHEMICAL – PETROLEUM – ENERGY – COMMUNICATIONS – MARINE – NUMERICAL CONTROL • TELEPHONE ENGINEERING <ul style="list-style-type: none"> – AIMS – DACCS – DIMS – FACT – MORE – VUSET

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- As of December 1979, the installed base of the three software products was:

	<u>Number of Installations</u>
FORETAX	58
FORESIGHT	196
INFONATIONAL	973

- The newly acquired division from Itel, Utility Data Management Services (UDMS), offers scientific and engineering remote computing services from its headquarters in Dallas and from a data center in Chicago. Business application RCS services are provided on an Itel AS-6 located in Metuchen (NJ). The majority of UDMS's computer time is sold on a bulk basis.
- Since the acquisition of UDMS, United has assigned management responsibility for the Metuchen (NJ) data center to On-Line Systems.
- On-Line Systems (OLS) was acquired by United Telecommunications in November 1979. Prior to the acquisition, OLS was a publicly held, international computer services firm.
- At its fiscal year ended April 30, 1979, OLS reported revenues of \$29,249,683 and net income of \$2,188,501. Revenues increased 29% over 1978's \$22,618,507, and net income showed a gain of 33% from \$1,643,676.
 - Management attributes \$3.1 million of the increase in revenues of \$6.6 million to a gain in commercial and government revenues in North America. The remaining growth of \$3.5 million was derived from its European operations, primarily from the accelerated growth of Atkins On-Line.
 - Approximately 31% of OLS's FY 1979 revenues were derived from international operations.
- OLS expected FY 1980 profits to be down due to the loss of a large contract with the Department of HEW. This contract contributed about \$5.3 million to OLS revenues in FY 1979.
- Subsidiary operations of OLS consist of:
 - OLS Computer Services Canada, Ltd. and On-Line Computer Services Holding (U.K.), Ltd.: registered companies in Canada and the United Kingdom which provide remote computing services.
 - Atkins On-Line Limited: acquired by OLS in 1977, Atkins provides remote computing and consulting services in the U.K.

and continental Europe. Atkins has recently been merged into the United Computing International Division.

- . OLS One-Call Systems, Inc.: located in Pittsburg, PA, One-Call offers On-CALL, a notification system which processes contractors' underground location requests, and advises member utilities and municipalities having underground facilities in an excavation area.
- . Dynabank Corporation, Atlanta, GA: acquired by OLS in April 1979 for \$446,829 in cash. Dynabank provides financial data services to approximately 250 banks and corporations.
- OLS and its subsidiary operations provide interactive, remote batch, batch, and distributed data processing services.
 - . In January 1979, OLS announced a distributed data processing capability. Called OUTLINE/I, the system combines a Datapoint intelligent terminal, applications software facilities, and a file transfer program. OUTLINE/I functions as a self-contained intelligent data entry and optional printing station with communications capabilities. It allows users to do data entry locally and is capable of validating, editing, and performing local file manipulation. The system can be purchased for \$5,950 or leased for \$295 per month on a one-year lease arrangement.
- OLS's program library consists of over 800 applications. A profile of the major applications offered on OLS's network is presented in Exhibit B.
 - . Approximately 50% of OLS network service revenues are derived from general business applications and 50% from general utility programs.
 - . Primary products used on the network are OLIVER (data base management), OSCAR (project scheduling and control), FMS (financial modeling), and OMAR (sales lead processing).
 - . OLS's network uses DEC hardware as opposed to the UCS network of CDC/CRAY equipment. The services will remain separate, although UIS plans to integrate the UCS and OLS networks into a single network.
- Dynabank, a subsidiary operation of OLS, offers a number of systems and programs designed to meet the specific accounting and financial reporting needs of banks and other financial institutions.
 - . Dynabank's primary products include the Investment System, the Trust System, and Dynacash.

EXHIBIT B

OLS NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – DEC SYSTEM 10S, MODIFIED VERSION OF TOPS 10 • DISTRIBUTED DATA PROCESSING CAPABILITY <ul style="list-style-type: none"> – OUTLINE/1 • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – APL – BASIC – COBOL – FORTRAN – SIMULA – SPL (STRUCTURED PROGRAMMING LANGUAGE) • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – OLIVER • DATA BASES AVAILABLE <ul style="list-style-type: none"> – OASES (SECURITIES) • PROJECT MANAGEMENT <ul style="list-style-type: none"> – OSCAR • FINANCIAL APPLICATIONS/TOOLS <ul style="list-style-type: none"> – FMS (FINANCIAL MODELING) – ORBIS (BUDGETING) – OMAR (MARKETING/SALES) • BANKING AND FINANCE* <ul style="list-style-type: none"> – INVESTMENT SYSTEM – TRUST ACCOUNTING – DYNACASH (CASH MANAGEMENT) – OTHER: COLLATERAL PRICING, LOAN AMORTIZATION, FINANCIAL MODELING AND CREDIT ANALYSIS 	<ul style="list-style-type: none"> • INDUSTRY SPECIFIC <ul style="list-style-type: none"> – ON-CALL (FOR UTILITY COMPANIES) – MOP (MELT OPTIMIZATION FOR THE METALS INDUSTRY) • MATHEMATICS <ul style="list-style-type: none"> – NUMEROUS ROUTINES FOR: <ul style="list-style-type: none"> • CURVE FITTINGS • DIFFERENTIATION • MATRIX MANIPULATION • POLYNOMINAL ROOTS • SCIENTIFIC AND ENGINEERING <ul style="list-style-type: none"> – NUMEROUS ROUTINES FOR: <ul style="list-style-type: none"> • ELECTRICAL ENGINEERS • CIVIL ENGINEERS • STATISTICS <ul style="list-style-type: none"> – SAS – SPSS – NUMEROUS ROUTINES FOR: <ul style="list-style-type: none"> • FACTOR ANALYSIS • PROBABILITY • TIME SERIES ANALYSIS • REGRESSION • STATISTICAL MEASURES • TESTS OF HYPOTHESES • FREQUENCY DISTRIBUTION • OTHER <ul style="list-style-type: none"> – GDS (ON-LINE GRAPHICS) – SCREEN (CRT PROTOCOL OPTIMIZATION) – TEXT (WORD PROCESSING)

* ONLY AVAILABLE TO DYNABANK CLIENTS

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- The Investment System is an extensive bond valuation, accounting, and reporting system.
- The Trust package is a personal trust accounting system designed for the small to medium size trust department (under \$100 million in trust assets) and has a heavy orientation toward portfolio management, customer reporting, and tax reporting.
- Dynacash is a multi-bank reporting system offered to over 35 major corporations. It allows the corporate user to collect daily balance information on checking accounts located in banks throughout the country.
- A number of other products are available in Dynabank's program library, including collateral pricing, loan amortization schedules, bank financial modeling, and credit analysis.
- OLS also offers remote computing services on two Intel AS-6 computers running under VM/CMS and MVS. A series of applications for business planning and control are available.
- The areas of project management, government planning and budgeting, and marketing/sales management reporting will continue to receive high priority from OLS in terms of software development and marketing.
- United Computing International (UCI) Division was established to coordinate all international business activities.
 - Processing services, contributing about 75% of UCI's revenue, are provided from a data center managed by the United House in London. Additional computing resources are provided by a dedicated link to United's data center in Kansas City.
 - UCI expanded its RCS service offerings to Switzerland and West Germany in 1978 through an arrangement with FIDES Data Center, a division of FIDES Trust Company of Zurich. FIDES provides marketing support for UIS products and services as well as a network link to major European cities.
 - The remaining 25% of UIS's revenues are derived from software sales (15%) and professional services (10%).
 - UIS's services are marketed throughout Europe, Australia, and Japan via agents.
- Calma, acquired by United Telecommunications in 1978, is considered to be the third largest provider of CAD/CAM systems. Growing at over 50% per year, Calma's 1979 revenues are estimated to be about \$42 million.

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

- Calma manufactures and markets integrated CAD/CAM work stations for the manufacturing industry and for engineers and architects. The work stations feature light pen input, visual two- and three-dimensional displays, and graphical output on a variety of plotters.
- A Data General Eclipse minicomputer is used as the central processor in all configurations.
- Principal products include:
 - . GDS II (Graphic Data System): an advanced interactive graphic system for the design of very large scale integrated (VLSI) circuits. Units sell for \$250,000-600,000 dependent on the type of plotters, input devices, and disk storage devices selected.
 - . DDM (Design, Drafting and Manufacturing): an interactive graphics system which addresses the problems of design, documentation, and manufacture of three-dimensional piece parts and assemblies. Price range of DDM is between \$300,000-500,000.
 - . CGI (Calma-Graphic Interactive): combines interactive graphics with a data management system for cartographic applications. CGI allows effective collection, organization, manipulation, display, and reporting of vast amounts of graphic and non-graphic data essential to computer-based mapping. The price range for CGI is \$250,000-500,000.
 - . CADEC (Computer-Aided Design for Engineers and Contractors): provides architects, engineers, and the construction industry with a comprehensive automation tool for project management, three-dimensional design, drafting, and documentation. CADEC installations range in price from \$250,000-500,000.
- UIS plans to combine some of the capabilities of Calma's CAD/CAM systems with its remote computing services. The intent is to offer an integrated distributed design system for engineers. The Calma system will offer engineers interactive layout, conceptual design, and drafting capabilities. These features will be coupled with the design analysis capability of the world's fastest computer, the CRAY 1, and with the APEX System.

INDUSTRY MARKETS

- UIS's 1979 industry market revenues are estimated by division as follows:

INDUSTRY	NIS	OLS	UCI	BIP	CALMA
Discrete Manufacturing		19%	20%	15%	
Process Manufacturing		16	20	10	
• Discrete and Process	12%				80%
Transportation		1	10	8	5
Utilities	36	4	10	7	
Banking and Finance	5	10	7	10	
Insurance			5	5	
Medical/Hospital		1		5	
Education				3	
Retail Distribution				10	
Wholesale Distribution		2	8	15	
Federal Government		37	5		
State and Local Government		1	15		
• Federal and State	5				10
Services	8	2		10	5
Other	34	7		2	
TOTAL	100%	100%	100%	100%	100%

COMPANY HIGHLIGHT/UNITED INFORMATION SYSTEMS GROUP

GEOGRAPHIC MARKETS

- Divisional revenues from geographic areas served by UIS in 1979 were:

GEOGRAPHIC REGION	NIS (U.S.)	OLS	UCI	BIP	CALMA
U.S.					
- New England	9%	6%		5%	10%
- Middle Atlantic	22	26		20	10
- East North Central	6	10		15	10
- West North Central	13	1		3	
- South Atlantic	13	47		20	
- East South Central	3	1		2	
- West South Central	16	4		15	
- Mountain	4	1		4	
- Pacific	13	4		16	30
International					
- Canada	1				
- Europe			93		30
- Japan					10
- Australia			5		
- South America			2		
TOTAL	100%	100%	100%	100%	100%

COMPUTER HARDWARE

- The remote computing services of both the NIS and OLS operations are delivered through UNINET, United Information System's international communications network. Divisional data centers are located in:
 - UCS NIS Division.
 - Kansas City
 - 3 CDC 6600s, APEX.
 - 4 CDC Cyber 170s, APEX.
 - 1 IBM 360/65, RUSH/OS.
 - 2 CDC 3300s.
 - 1 Cray-1, COS.
 - Boston
 - 4 CDC 3600s, ST/OS.
 - UCS Utility Data Management Services Division
 - Dallas
 - CDC Cyber 176.
 - Chicago
 - Univac 1100.
 - United International
 - London
 - 2 CDC 6500s, APEX/SCOPE.
 - 2 Xerox Sigma 9s.
 - 4 H-P 2116Bs.
 - 1 DEC PDP 11/40.
 - 1 DEC System 10.
 - 3 DEC PDP 11/34s.
 - On-Line Systems.
 - Pittsburgh
 - 4 DEC KA10s, TOPS 10.
 - 11 DEC KI10s, TOPS 10.
 - 1 DEC KL10, TOPS 10.
 - Metuchen, NJ
 - 1 Itel AS-6, VM/CMS.
 - 1 Itel AS-6, MVS

COMPANY HIGHLIGHT

MARKET COMPILATION RESEARCH BUREAU

North Hollywood, CA

Richard Yung, President
Subsidiary of MCRB, Inc.
Total Employees: 150, including parent
Total Revenues: Unknown
Non-Captive Revenues: 55%

THE COMPANY

- The parent, MCRB, Inc., is a mailing list firm. Market Compilation Research Bureau (MCRB) is the data processing arm of the parent and was spun off as a separate division in 1978 to provide computer services to the private sector.
- Forty-five percent of MCRB Service Bureau revenues are captive revenues from the parent and are primarily list maintenance and label printing for market research applications.
- MCRB's clients are widely dispersed throughout all industry sectors and across all U.S. geographic regions. There are no international clients at the present time.

KEY PRODUCTS AND SERVICES

- MCRB provides the following services to the private sector:
 - Batch processing.
 - Remote batch via microwave and normal phone lines.
 - A software package called INTERACT, which is used by programmers in software development. It is a product of Cullinane Corporation.
- The processing is handled by twin IBM 360/65s and the printing is handled with eight 1403 printers. The company added one meg of core last month and will be adding a bank of disk drives in three months. There are also plans to add an IBM 370 in nine months. The operating system used on the 360s is OS:21.8F/HASP 4.1 SHARED DASD.
- The data management system is VSAM/QSAM/BTAM/BDAM/ISAM.
- MCRB also provides interface for users who install mini-based systems using the IBM 5280.

COMPANY HIGHLIGHT

BOEING COMPUTER SERVICES COMPANY

177 Madison Avenue
Morristown, NJ 07960
(201) 540-7700

Robert W. Tharrington, President
Division of The Boeing Company
Total employees: 6,500+
Total revenues, fiscal year end
12/31/79: over \$400,000,000*
Non-captive revenues: \$93,000,000*

THE COMPANY

- Boeing Computer Services (BCS) was formed as a wholly owned subsidiary of The Boeing Company in 1970. In 1978, BCS became a division of Boeing.
- BCS's non-captive (commercial) revenues in 1979 are estimated by INPUT to be approximately \$93 million. This reflects an approximate increase of 19% over 1978's revenue estimate of \$78 million.
- BCS is organized as follows:
 - BCS Western Region, Seattle (WA): Supports and markets all internal and external BCS remote computing services west of the Mississippi.
 - BCS Eastern Region, Vienna (VA): Supports and markets all internal and external BCS remote computing services east of the Mississippi.
 - BCS Federal Teleprocessing Region, Vienna (VA): Markets remote computing services to federal government agencies and to commercial clients in Maryland, Virginia, and Washington, D.C.
 - Federal Systems Group, Vienna (VA): Markets remote computing services, consulting, and training services to the military and space agencies.
 - BCS Consulting Division, Seattle (WA): Provides consulting and contract programming support to internal and external clients.
 - BCS Training Division, Seattle (WA): Provides educational training support to internal and external clients.
 - BCS Financial Services Group, Seattle (WA): Provides processing services for commercial banks, thrift institutions, credit unions, and an electronic switch to support electronic funds transfer.
- BCS's major strength lies in its ability to offer a full line of services to the computing community. Major services offered are:

* INPUT estimate

COMPANY HIGHLIGHT/BOEING COMPUTER SERVICES COMPANY

- Full batch and interactive computing services on large scale IBM and CDC hardware.
- Support to the banking and thrift industry through the BCS Financial Services Group.
- Education and training.
- Consulting services.
- Application packages and support for engineering and financial management.

KEY PRODUCTS AND SERVICES

- BCS's non-captive revenues for 1979 are estimated by INPUT as follows:

	<u>Percent Of Total Revenue</u>	<u>Revenue Value (\$ Million)</u>
Processing services	53%	\$49.3
Software products	10	9.3
Professional services	17	15.8
Facilities management	<u>20</u>	<u>18.6</u>
	100%	\$93.0

- The BCS network is one of the largest privately managed communications networks serving the U.S., Canada, and the United Kingdom. Processing services provided include interactive, remote batch, and batch.
 - Remote computing services are available through three access modes of the MAINSTREAM® timesharing service.
 - MAINSTREAM-CTS (Conversational Terminal Service) is a conversational timesharing service designed for both interactive and overnight processing on IBM 3033 equipment.
 - MAINSTREAM-EKS (Enhanced KRONOS System) provides a powerful computing capability for scientific and engineering applications through the use of a configuration of CDC Cyber computers.
 - MAINSTREAM-TSO (Time Sharing Option) is oriented toward remote job entry and batch processing with on-line editing, file updating, inquiry, and program development capabilities. TSO operates on IBM 3033 equipment and is directed toward large volume users.

COMPANY HIGHLIGHT/BOEING COMPUTER SERVICES COMPANY

- A profile of the applications available from BCS is presented in Exhibit A.
- INPUT estimates network services contributed about \$49.3 million of BCS's external revenue in 1979. An additional breakdown of these revenues follows:
 - . Type of processing
 - Remote computing 97%
 - Batch 3%
 - 100%
 - . Modes of remote computing
 - Interactive 20%
 - Remote batch 80%
 - 100%
 - . Applications
 - General business 14%
 - Scientific and engineering 24
 - Industry specialty 5
 - Utility 57
 - 100%
- New product areas which will be emphasized by BCS are applications for finance, scientific and engineering, banking, and thrift services.
- The Financial Services Group employs about 250 people and is organized in three autonomous divisions:
 - Bank Services Division offers a full range of commercial bank-related services including more than 20 different system applications in its seven data centers. This includes basic item processing, deposit, and loan systems, as well as specialized services such as on-line inquiry, CIF, share draft processing, and lease accounting.
 - . Processing for the Bank Services Division is handled by the BCS data center in Seattle. Remote job entry sites with IBM 360/40 or Cummins-Allison equipment are located in Modesto, Bakersfield, and Huntington Beach (CA), and in Albuquerque and Roswell (NM).
 - Thrift Services Division offers an equally comprehensive set of services, including demand deposit and NOW accounting, for Mutual Savings Banks and Savings and Loan Associations. The Thrift Division currently serves in excess of 1,500,000 accounts through over 500 on-line teller terminals.

EXHIBIT A

BCS NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – MAINSTREAM-CTS, IBM 370 – MAINSTREAM-EKS, CDC CYBER 175, 750, 760 – MAINSTREAM-TSO, IBM 3033 • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – ALGOL : – PL/1 – APL – PASCAL – ASSEMBLER – SNOBOL 4 – BASIC – SIMSCRIPT 11.5 – COBOL – WAT FIV – FORTRAN • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – DMS-170 – INQUIRE – EASY TRIEVE – MARK IV – GIS/2 – SYSTEM 2000 – IDMS • DATA BASES AVAILABLE <ul style="list-style-type: none"> – CITIBASE – EIS ECONOMIC DATA • INDUSTRY SPECIFIC <ul style="list-style-type: none"> – SUPERACT (INSURANCE) – COMPLETE LINE OF BANKING APPLICATIONS – COMPLETE LINE OF THRIFT APPLICATIONS • FINANCIAL APPLICATIONS/TOOLS <ul style="list-style-type: none"> – EXECUTIVE INFORMATION SYSTEM (EIS) <ul style="list-style-type: none"> • CASH CONTROL • CURRENCY CONVERSION – PLANNING SYSTEM GENERATOR (PSG) – FINANCIAL PLANNING (FPS) – BUSINESS ANALYSIS (BA/BASIC) – PAUS 	<ul style="list-style-type: none"> • PROJECT MANAGEMENT <ul style="list-style-type: none"> – PROJECT 2 – MPSX – PMS IV – MINIPERT – PROJACS – CPM – APEX III – ICES PROJECT 1 • STATISTICAL <ul style="list-style-type: none"> – STATISTICAL ANALYSIS (SAS, BMDP, STATPACK2, STATPK) – SCSS (CONVERSATIONAL SPSS) – SCIENTIFIC INFORMATION RETRIEVAL (SIR) – SPSS – STAT/BASIC • STRUCTURAL/STRESS ANALYSIS <ul style="list-style-type: none"> – ANSYS – MARC – ESAP – SAP IV – GT STRUDAL – STAGS – NASTRAN – TRUS – TPIPE – E3 SAP – – STARDYNE • SCIENTIFIC AND ENGINEERING <ul style="list-style-type: none"> – SAIR II – BANDIT – HEC/HEC 2 – MITAS – BLAST – TRACE – WREM – SCOUT – PDQ7 – RELAP4 – COGO – MORSE – HYDRA – CORNAP – – SURVEY • GRAPHICS/PLOTTING <ul style="list-style-type: none"> – BIGS – ZETALIB – DISSPLA – CALCOMP – TELL-A-GRAPH – TEKTRONIX – INSTAPLOT – HPLIB – AGII – GSILIB – – SC4020 • OTHER <ul style="list-style-type: none"> – SCHOLAR/TEACH 3

- The data center for Thrift Services is in Philadelphia. Remote job entry sites are located in Morristown (NJ) and Atlanta (GA).
- Electronic Funds Transfer Systems (EFTS) offers an EFT service over an on-line network of shared automated teller machines and financial point-of-sale terminals.
 - The EFT software, FINESS, is also available on a license basis. BCS initially developed the system for The Exchange in Washington, one of the first EFTS projects in the U.S.
- Software product sales, contributing approximately 10% of BCS's external revenues, are provided by the following applications:
 - Executive Information Services (EIS): an interactive computerized planning, tracking, and control system that combines data base management, financial and statistical analysis, report writing, modeling, and graphics capabilities.
 - System Analysis and Resource Accounting (SARA): a system performance, evaluation monitoring, and reporting system for measuring computer capacity. There are over 150 installations of SARA.
 - Production Management System (PMS): an on-line, integrated manufacturing planning and control system for use on an HP 3000 minicomputer. Subsystems of PMS include: Bill of Materials, Master Schedule, Material Requirements, Inventory Control, Purchase Order, Parts, Shop Control, Job Routing and Standards, Performance Reporting, Accounting Feedback, and Estimating.
 - Other software products marketed by BCS are:
 - BCS Conversational APT.
 - MINIAPT.
 - ROOTS - a Fortran Enhancement.
 - FINESS (FINancial Electronic Switching System) for electronic funds transfer.
 - SCHOLAR/TEACH 3.
- Professional services supply an estimated \$15.8 million of BCS's revenues. This includes contract programming, consulting, and education and training services.

COMPANY HIGHLIGHT/BOEING COMPUTER SERVICES COMPANY

- The BCS Education and Training Division offers more than 60 courses on hardware and software technology. Its National Training Center is located in Seattle, with additional training centers in Detroit, New York, Chicago, San Francisco, and Washington, D.C.
 - Major training centers are equipped with classrooms, theater/conference rooms, audio visual equipment, and a variety of on-site computer hardware.
 - BCS also markets SCHOLAR/TEACH 3, a group of computer based instruction products which are available on the BCS network and sold separately for in-house use.
 - Making It Count is an introduction to computing course which has been offered on television by many colleges and universities as an extension course.
- Facilities management services are provided to commercial clients and government agencies. Accounting for approximately 20% of BCS's revenues, the largest contracts are held with the Department of Energy for its Richland, Washington facility, and with the Department of HEW for management of its Guaranteed Student Loan Program.

INDUSTRY MARKETS BCS's non-captive industry revenues for 1979 are estimated as follows:

Discrete manufacturing	1%
Process manufacturing	1
Transportation	3
Utilities	1
Commercial Banks	5
Thrift institutions	15
Insurance	1
Education	3
Federal government	20
State and local government	5
Services	13
Other (construction and engineering)	<u>32</u>
	100%

GEOGRAPHIC MARKETS INPUT estimates 92% of BCS's revenues are derived from the U.S. Of this, 30% stems from the East and 62% from Western states. Canadian clients account for 4% and European sources contribute the remaining 4%.

COMPUTER HARDWARE

- BCS offers remote computing services on a variety of CDC CYBER and IBM equipment. Major data centers for commercial clients are located in Vienna (VA), Renton (WA), Kent (WA), Philadelphia (PA), and Wichita (KS).
 - Local dial-up is available to over 100 cities. BCS plans to expand its services to additional locations in 1980.
 - In 1980, BCS announced the signing of a service agreement with Satellite Business Systems to use its digital and voice communications network.

COMPANY HIGHLIGHT

MC DONNELL DOUGLAS AUTOMATION COMPANY (MCAUTO)

P.O. Box 516
St. Louis, MO 63166
(314) 232-0232

W. R. Orthwein, Jr., President
Division of McDonnell Douglas
Corporation
Total Employees: 4,909
Total Revenues, Fiscal Year End
12/31/78: \$286,775,000
Non-Captive Revenues: \$128,196,000

THE COMPANY

- The McDonnell Automation Company was established as a separate division in 1960 to support the internal EDP requirements of the corporation and to sell excess time to the commercial sector. In 1968 the company began offering timesharing services. Emphasis on competing actively in the computer services market was reinforced in 1970 when the McDonnell Automation Company, Douglas Information Services and its Astronautics Division were merged into MCAUTO. In the same year MCAUTO entered the health care field by acquiring a hospital data processing system and began offering it nationally on its network service.
- MCAUTO derives the majority of its revenues from remote computing services. Its Health Services Division is currently the second largest computer services vendor in the hospital industry.
- Revenues from the commercial sector have grown at least 24% per year for the last five years with the exception of 1978. MCAUTO expected a 20% increase in commercial revenues in 1978 and actually achieved 15%. The decline was attributed to:
 - Reduced sales by the Health Services Division because word circulated that a new distributed-health-care system would be announced and the Division had difficulty selling existing systems.
 - Lower revenues from United Computing Corporation than expected.
- MCAUTO has forecasted a 21% increase in non-captive revenues for 1979. If this is achieved, MCAUTO's non-captive revenues will be approximately \$155 million. A five year financial summary of MCAUTO's captive and non-captive revenues follows:

COMPANY HIGHLIGHT/MC DONNELL DOUGLAS AUTOMATION COMPANY
(MCAUTO)

MCAUTO
FIVE YEAR FINANCIAL SUMMARY
(\$ Thousands)

ITEM \ FISCAL YEAR	1978	1977	1976	1975	1974
Captive revenues	\$158,579	\$125,373	\$113,349	\$108,061	\$ 90,100
• Percent of total revenues	55%	53%	60%	66%	67%
Non-captive (commercial) revenues	\$128,196	\$111,737	\$ 76,849	\$ 55,520	\$ 44,800
• Percent of total revenues	45%	47%	40%	34%	33%
• Percent increase from previous year	15%	45%	38%	24%	36%
Total revenues	\$286,775	\$237,110	\$190,198	\$163,581	\$134,900

- In 1979, MCAUTO merged its subsidiary, United Computing Corporation, into its CAD/CAM organization.
- The 1979 acquisition of Microdata by McDonnell Douglas Corporation will not affect MCAUTO at the present time. Plans are to operate Microdata as a separate corporate subsidiary. MCAUTO is investigating joint development of new product areas with Microdata, however.
- In 1978, MCAUTO's 4,909 personnel were segmented as follows:

- Marketing/sales	1,141
- Software services and computer operations	3,074
- General and administrative	507
- United Computing personnel	187
	<hr/> 4,909
- MCAUTO's major competitor for health care services is Shared Medical Systems. Additional competition comes from Tymshare, HBO and Technicon. Major competitors for remote computing services are Tymshare, Computer Sciences, GEISCO, University Computing and Manufacturing Data Systems.

KEY PRODUCTS AND SERVICES

- Approximately 85% (\$109 million) of MCAUTO's non-captive revenues are from processing services, 10% (\$12.8 million) from professional services, and 5% (\$6.4 million) from turnkey system sales.

COMPANY HIGHLIGHT/MC DONNELL DOUGLAS AUTOMATION COMPANY
(MCAUTO)

- In 1978, MCAUTO's processing service revenues were derived from the following sources:

MCAUTO
PROCESSING SERVICE REVENUES

Type	Percent of Processing Services Revenues	Revenue Value (\$ Millions)
General Business	21%	\$ 23
Scientific and Engineering	14	15
Utility	7	8
Industry Specialty		
. Health	45	49
. Communications	11	12
. Insurance	2	2
	100%	\$ 109

- The applications available on MCAUTO's network are listed in Exhibit A. The largest revenue producing applications on the network, excluding medical, are those which support communications (telephone industry), engineering, management control, financial applications, and the distribution industry.
 - New products recently announced on the network are:
 - PIPELINE, used to design and analyze piping systems in refineries and chemical, petrochemical and power plants. PIPELINE is also linked to FASTDRAW, a graphics and display system.
 - IVESS, Interactive Vehicle Scheduling System, for scheduling trucking routes in the transport of mail for the U.S. Postal Service. MCAUTO has an exclusive license for IVESS from the developer, Decision Graphics.
 - EBS, MCAUTO's Employee Benefit System, automates the basic claim entry, calculation, and payment functions associated with the processing of employee claims for medical, dental, and vision care.
 - MCAUTO has no current plans to release a general-purpose user site hardware service in conjunction with the network. Instead, the company plans to offer new minicomputer/network services in specific application areas. Potential product areas are within engineering, communications (telephone industry), health care, distribution and insurance industries.
- Several new minicomputer/network products have recently been announced by MCAUTO:
 - Distributed FASTDRAW, an interactive structural modeling and graphic display system, has been made available on Hewlett-Packard 3000 minicomputers located in regional offices in Los Angeles, New York and St. Louis. MCAUTO is offering clients unlimited access to FASTDRAW

EXHIBIT A

KEY APPLICATIONS AVAILABLE ON MCAUTO'S 370 AND CYBER SERVICE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – CDC CYBER 74 AND 175, NOS – IBM 3032, 3033, 370/148, 158, 168, OS/MVS • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – APL – FORTRAN – ASSEMBLY – PL/1 – BASIC – SIMSCRIPT – COBOL • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – IMS – SYSTEM 2000 – CONFIRM • BUSINESS AND FINANCE <ul style="list-style-type: none"> – AUTOCOUNTANT (ACCOUNTS PAYABLE, RECEIVABLE, FIXED ASSETS, GENERAL LEDGER, PAYROLL, PERSONNEL) – FINANCIAL PLANNING (AUTOPLAN) – SHAREHOLDER RECORDS – STOCK TRANSFER (ASTS) – DIVIDEND REINVESTMENT (DRS) – CHECK RECONCILIATION • HOSPITAL COMMUNICATION AND INFORMATION SYSTEM <ul style="list-style-type: none"> – PATIENT CARE (HPC) – DATA COLLECTION (HDC) – FINANCIAL CONTROL (HFC) • MANUFACTURING/DISTRIBUTION <ul style="list-style-type: none"> – PROCESS PLANNING (CAPP) – CAPACITY PLANNING (CAPOSS) – ON-LINE ORDER PROCESSING (CO-OP) – FREIGHT RATING AND ROUTING – VEHICLE SCHEDULING (IVESS) – MATERIAL REQUIREMENTS PLANNING (MRP) – NUMERICAL CONTROL (COMPUDRIVE) – MATERIAL MANAGEMENT (OMEGA) 	<ul style="list-style-type: none"> • OPERATIONS RESEARCH/STATISTICAL <ul style="list-style-type: none"> – BOX-JENKINS PROGRAMS – CONTINUOUS SYSTEMS MODELING – SIMULATION (GASP IV, GPSS V) – NETWORK OPTIMIZATION (GNET) – STATISTICAL (SAS, STATPAK/TSO, UCLA BMD, COSAN, IBM SCIENTIFIC SUBROUTINES, IMSL LIBRARIES) • INSURANCE/HEALTH CARE <ul style="list-style-type: none"> – EMPLOYEE BENEFIT (EBS) – GROUP CLAIMS (GCPS) – MEDICARE B CLAIMS – PATIENT SERVICE RECORDS (PSRS) – MEDICAL RECORDS ABSTRACTING • EDUCATION <ul style="list-style-type: none"> – ON-LINE EDUCATIONAL SERVICE (AESOP) – ATTENDANCE – CENSUS REPORTING – FINANCIAL ACCOUNTING; PAYROLL – GRADE REPORTING – STUDENT SCHEDULING • SCIENCE AND ENGINEERING <ul style="list-style-type: none"> – CHEMICAL PROCESS ENGINEERING – CIVIL ENGINEERING – ELECTRIC POWER ENGINEERING – MATHEMATICS – ELECTRONICS ENGINEERING – NUCLEAR ENGINEERING – STRUCTURAL ENGINEERING – MCAUTO OFFSHORE PROGRAMS – NISEE EARTHQUAKE PROGRAMS – MECHANICAL ENGINEERING (BUILDING, DUCT DESIGN, HEAT TRANSFER, PIPING AND VESSELS) • OTHER <ul style="list-style-type: none"> – TELEPHONE INDUSTRY APPLICATIONS – GRAPHICS (VIVADATA, FASTDRAW) – TEXT EDITING (DATA DIALOG) – PROJECT MANAGEMENT – PROGRAM AIDS – COMPUTER OUTPUT MICROFILM

COMPANY HIGHLIGHT/MC DONNELL DOUGLAS AUTOMATION COMPANY
(MCAUTO)

- for a fixed monthly fee of \$3,000 per month. The system will serve as an engineering work station for the construction of two and three dimensional models.
- Two new claims processing systems using Four Phase IV/60's connected to MCAUTO's 370 host system were announced in January 1979. All systems perform data entry functions with some limited local application processing. The claims processing systems will be leased and processing charges will be priced on a transaction basis. Average cost of the systems will range between \$2,000 and \$3,000 per month.
 - Group Claims Reporting System (GCRS), provides editing and claims data; calculation of totals, deductibles and co-insurance; local creation of drafts, draft registers and benefit explanation; and local printing of statistical reports.
 - Workers Compensation (WCTS), provides detailed and summary information on in-house and state claims and accident analysis reports.
 - MCAUTO's Automated Shareholder Records Systems (ASRS) is also available on Four Phase IV/60 equipment. ASRS is an accounting system for shareholder records management which can be used by banks and corporations. The system handles certificate and balance sheet accounting for stock classes, cash dividends and checks, proxy ballots, stock splits, tax reporting, year-end purging and mailing labels.
 - Although not a new product offering, AUTOCOUNTANT, a financial management system which offers host processing for general ledger, accounts payable, fixed assets, account receivable/sales analysis, personnel and payroll is now available on a Four Phase IV/60. MCAUTO currently has 40-50 AUTOCOUNTANT mini-based systems installed.
- MCAUTO is also interested in developing additional application products for computer aided design and manufacturing (CAD/CAM). Development efforts are currently underway to integrate the following products:
 - UNIGRAPHICS, an interactive graphics system, developed to support all phases of the design/manufacturing cycle and currently offered as a turnkey system using Data General System ECLIPSE or DEC 11/70 equipment.
 - CADD (pronounced "caddy") is a high powered computer aided design and drafting system which is used extensively in aircraft design.
 - The Health Services Division (HSD) was established in 1970 when MCAUTO purchased a hospital information system from the Third Order of the Sisters of St. Francis. HSD's current client base is about 900 health care institutions, which generated about \$58 million in revenues in 1978. (Approximately \$9 million of HSD's revenues were derived from equipment sales and reimbursed expenses.) A five year statistical summary of HSD's growth follows:

MCAUTO HEALTH SERVICES DIVISION
STATISTICAL DATA

ITEM \ FISCAL YEAR	1978	1977	1976	1975	1974
Hospitals Served	449	427	376	315	260
Number of Beds	89,414	88,429	81,000	69,000	55,000

- The major components of MCAUTO's health service applications are:
 - Hospital Financial Control System (HFC).
 - Consists of patient census billing, accounts payable and receivable, payroll and personnel profile, financial statements and reports, property accounting, inventory control, utilization review and medical records.
 - HFC is currently being used by 538 hospitals in 44 states including Alaska and the District of Columbia.
 - Health Data Collection System (HDC).
 - HDC uses intelligent visual display terminals located at nursing stations and in service departments. The terminals are linked to in-hospital minicomputers (DEC PDP/11's) and perform functions for admission, outpatient and emergency registration, order entry and charge collection.
 - HDC has been offered since 1975 and has 43 hospital users.
 - Hospital Patient Care System (HPC).
 - HPC has been offered since 1970 and provides a separate but integrated system for laboratory, admitting, nursing stations, pharmacy, radiology, central supply, outpatient/emergency room and respiratory therapy.
 - Medical Records Information System (MRII).
 - MCAUTO purchased the MRII marketing rights from California Health Data Corporation in 1976. MRII collects, edits, analyzes, and reports medical record statistics for inpatients (MRII/IP), outpatients (MRII/OP), and emergency room (MRII/ER).
 - There are more than 300 users of the MRII system.
 - Physician Data Services (PDS).
 - Provides medical groups with patient accounting and financial management information. PDS has been offered since 1977 and has 70-80 users.
 - Patient History Index (PHI).
 - Offered since 1977, PHI provides access to account status, multiple patient account records and bad debt accounts.

COMPANY HIGHLIGHT/MC DONNELL DOUGLAS AUTOMATION COMPANY (MCAUTO)

- HFC/basic.
 - HRC/basic is designed for use in hospitals with 125 beds or less. It provides patient billing and accounts receivable, payroll, accounts payable and financial statements, and reports and data stat.
- MCAUTO is currently developing two new systems:
 - Patient Care System (PCS) will use a Tandem minicomputer and incorporate all application functions of the HFC, HDC, and HPC systems. PCS will operate on a standalone basis or in conjunction with MCAUTO's network.
 - The new PCS system is targeted to hospitals with 250 beds or more.
 - A basic configuration will be priced at about \$250,000. Fully configured, the system may run as high as \$800,000. Price per patient per day will range from \$5 to \$7.
- A new time and attendance system is in development and will be offered on Four Phase equipment.

INDUSTRY MARKETS

- MCAUTO's non-captive revenues are derived from the following industry sectors (numbers are approximate):

- Discrete Manufacturing	12%
- Process Manufacturing	3
- Transportation	1
- Utilities	13
- Medical/Hospital	45
- Wholesale	3
- Retail	1
- Government	2
- Services	10
- Insurance	4
- Other	<u>6</u>
	100%

GEOGRAPHIC MARKETS

- The majority of MCAUTO's revenues are derived from the U.S. MCAUTO maintains offices in 66 U.S. cities and in Woking, England and Bonn, West Germany.
- Foreign licensing agreements to market MCAUTO services are held with:
 - Aquitaine Systemes for France, Spain and Portugal.
 - BOC Datasolve for the United Kingdom.
 - DATEMA AB for Sweden, Norway, Denmark and Finland.
 - A special marketing arrangement is also held with Mitsoi Engineering and Shipbuilding in Japan.

COMPUTER HARDWARE

- MCAUTO maintains over 130 computers, of which 37 are on-line, in support of its computer operations. CDC Models 74 and 175 (NOS) and IBM 370 and 303X (OS/MVS) form the nucleus of the equipment used for network services.
- Remote computing services are supplied from two data centers in St. Louis (MO), and centers in Huntington Beach (CA) and Long Beach (CA). Access to the network is through MCAUTOnet, an internally developed data communications network.

COMPANY HIGHLIGHT

COMPUTER SCIENCES CORPORATION

650 North Sepulveda Blvd.

El Segundo, CA 90245

(213) 678-0311

William R. Hoover, President and
Chairman

Public Corporation, NYSE

Total Employees: 11,400 Worldwide

Total Revenues, Fiscal Year End

3/30/79: \$343,202,000

THE COMPANY

- Computer Sciences Corporation (CSC) was founded in 1959 as a Nevada corporation to provide consulting services in the design and implementation of system software, primarily operating systems and compilers. It has since expanded its professional services to include systems engineering and development, communications engineering, operation of clients' data centers on a facilities management basis, and the provision of large computer-communications systems on a turnkey basis, including software, hardware, operational procedures and training. It also provides remote data processing services through its international INFONET network, and a variety of other proprietary data services, including transaction processing, and data base-oriented and applications-oriented computer services.
- Total corporate revenues increased to \$343.2 million in 1979, a 24% gain over 1978 revenues of \$277.4 million. Earnings were adversely affected by a charge of \$1.9 million in the fourth quarter of 1979 due to the overthrow of the government of Iran and the resulting discontinuance of CSC's activities in that country. Had that political action not occurred, the 1979 growth over 1978, as shown in the five-year financial summary that follows, would have been: 1979 income before taxes, up 15%; net earnings, up 15%; and earning per share, up 21%.

COMPANY HIGHLIGHT/COMPUTER SCIENCES CORPORATION

COMPUTER SCIENCES CORPORATION
FIVE YEAR FINANCIAL SUMMARY
(\$ Thousands, Except Earnings Per Share)

ITEM \ FISCAL YEAR	3/30/79	3/31/78	4/1/77	4/2/76	3/28/75
Revenues					
• Contract services	\$250,713	\$199,068	\$176,976	\$171,417	\$139,446
• Data services	92,489	78,100	57,769	48,493	37,905
Total revenues	\$343,202	\$277,168	\$234,745	\$219,910	\$177,351
• Percent increase from previous year	24%	18%	8%	24%	21%
Income before taxes and extraordinary credit	\$ 28,360	\$ 26,343	\$ 21,220	\$ 14,459	\$ 7,227
• Percent increase from previous year	8%	24%	47%	100%	228%
Net income	\$ 14,198	\$ 14,016	\$ 11,635(A)	\$ 7,233	\$ 3,645
• Percent increase from previous year	1%	20%	61%	98%	133%
Primary earnings per share	\$ 1.07	\$ 1.00	\$.80 (B)	\$.51	\$.26
• Percent increase from previous year	7%	25%	57%	96%	117%

(A) Reflects net income prior to a \$3 million tax credit. Net income with the tax credit was \$14,635,000.

(B) Reflects earnings per share prior to tax credit. Earnings per share with the tax credit were \$1.01.

• CSC is grouped in two major business segments, Contract Services and Data Services, for financial reporting purposes.

- Contract Services are activities related to the development of a custom-designed communication or computer-based system, operational support of a client's technical activity, consulting, and facilities management services. These customized services are performed to a client's contractual specifications. The organizations involved in these activities employ about 9,700 people and consist of:

- Applied Technology Division.*
- Commercial Division.
- Defense Systems Division.*
- Energy Research Division.*
- System Sciences Division.*
- Systems Division.*
- Systems International Division.*

- Data Services are proprietary services, of which the most significant is INFONET, CSC's remote computing network service. The Data Services Group employs about 1,700 people, and consists of:

* Units of the System Group.

- . INFONET Division.
 - . Computer Sciences Canada.
 - . Computer Sciences Europe.
 - . CMS Industries.
 - . Economic Models Ltd.
 - . PAID Prescriptions.
- The Data Services Group has been actively seeking acquisitions to expand its service offerings to the commercial sector. Three companies have been acquired since 1978 and a major purchase of a portion of Itel's Data Services Group is currently pending.
 - PAID Prescriptions, Inc., based in Paramus, New Jersey, was acquired in January 1978. PAID processes pharmacies' claims for prescription drugs on behalf of medical plans and self-insured organizations that offer pharmaceutical benefits to members or employees.
 - Economic Models Ltd (EML), based in London, England, was acquired in February 1978. EML provides economic consulting services, forecasts of national economies, and econometric models and data base services.
 - . The acquisition of the claim-processing assets of PAID and all of the capital stock of EML was reported as a cash transaction in the amount of \$2,675,000.
 - CMS Industries, acquired in May 1979, provides specialized remote computing services (order entry, inventory management, accounting, and sales analysis) for the distribution industry. CMS' revenues were approximately \$3 million at the time of acquisition.
 - The pending acquisition of three units from Itel, the Data Processing Division/Batch, Data Processing Division/On-line and the Professional Services Division, will add approximately 800 employees and about ten data centers to CSC's Data Services Group. Activities of the Itel units include batch services to accounting firms and other organizations for income tax preparation, payroll, general ledger, and accounts receivable. On-line services are centered around applications for the distribution industry. The combined annual revenues of the Itel units are approximately \$36 million. CSC's preliminary purchase offer for these units is \$19 million in cash.
 - CSC's primary strength continues to be its large staff of professionals who are experienced in all areas of the scientific and commercial application of computer science, communications, systems engineering, and the space sciences. The diverse skills of the CSC professional staff enable the company to compete successfully in all EDP service and network application areas.
 - CSC intends to concentrate marketing and development efforts in five areas:
 - Continue to compete for contract services within the Federal Government.
 - Market large system development projects in the international sector.
 - Develop a services market to the hospital industry.

COMPANY HIGHLIGHT/COMPUTER SCIENCES CORPORATION

- Expand commercial service applications within INFONET to capture more business from domestic and international clients, especially multi-national corporations.
- Develop and expand the services offered by the Itel units, provided the acquisition is completed.

KEY PRODUCTS AND SERVICES

- Contract Services constitutes the majority of CSC's total revenues (73%). The remaining 27% stems from processing services provided by the Data Services Group. Exhibit A provides a breakdown of CSC's revenues from its service functions and industry groups.
- Contract Service revenues are primarily derived from Federal Government contracts held by the Systems Group and by facilities management contracts with state and local government agencies managed by the Commercial Division. Large development contracts within the international sector also contribute to CSC's Contract Service revenues.
 - CSC's 1979 contract revenues were \$250.7 million, a 26% increase over 1978 revenues of \$199.1 million. Contribution to operating income was \$20.1 million in 1979 versus \$19.7 million in 1978. The almost static growth in profit was attributed to the cessation of the Iranian operation and to the low profit margin associated with Federal Government contracts.
 - Approximately 41% (\$140.7 million) of CSC's total revenues was generated from supplying contract services to two Federal Government agencies: the National Aeronautics and Space Administration (26%) and the U.S. Navy (15%).
 - CSC's Applied Technology Division has several multi-million dollar contracts to provide facilities management and data processing support activities in NASA facilities at Goddard Space Flight Center, Johnson Space Flight Center, Marshall Space Flight Center, Kennedy Space Center, and the Ames Research Center. CSC's position as the primary computer services vendor for NASA places the corporation in an advantageous position for obtaining additional contracts in support of NASA's Space Shuttle Program.
 - Representative contracts held with the U.S. Navy are for the development of the Aegis weapons system and TRIDENT submarine system. Several service contracts are also held by CSC at Naval centers in San Diego, Pt. Mugu, China Lake (CA), and Warminster, PA.
 - Work performed for the Defense Communications Agency, the U.S. Army, and the Department of Energy also contributes significantly to Contract Services revenues.
 - In January 1979, CSC signed a five year contract with the Saudi Arabia Ministry of the Interior to provide a complete teleprocessing network for the Saudi government. The value of this contract is expected to

EXHIBIT A

COMPUTER SCIENCES CORPORATION

Revenue Sources
FYE 3/30/79

ITEM	Contract Services	Data Services	Total Corporation
Revenues by Markets			
- International	5%	13%	7%
- Commercial	6%	39%	15%
- State and Local Government	9%	1%	7%
- Federal Government	80%	47%	71%
Revenues by Service Function			
- Communications Engineering	8%		5%
- Data Services		100%	27%
- Facilities Management	34%		25%
- Systems Development	58%		43%
Revenue Contribution			
- Total Revenues	\$250.7	\$ 92.5	\$343.2
- Operating income*	\$ 20.1	\$ 18.1	\$ 38.2

* Operating income: Income before corporate overhead, interest, and taxes.

contribute \$221.5 million in revenues over the next five years. Work on this project will be headed by the Systems International Division.

- The Commercial Division has been successful in competing for a number of state and local government facilities management contracts. The largest of these is a contract to handle the claims processing functions for the State of California's Medi-Cal program. Other contracts currently held by the Commercial Division are with Orange County (CA), Pierce County (WA), and with the city governments of Torrance, Newark, and Cleveland.
- . In August 1979, CSC announced its entry into the hospital services market with a minicomputer system. Based on software developed by CSC and multiple Tandem T16 processors, the system will be marketed to hospitals with 300 beds or more.
 - Options available to hospitals include installing it on a turnkey basis, using it on a shared basis from a local data center established by CSC, or contracting for the use and operation of the system on a facilities management basis. CSC has no present plans to connect the hospital system with INFONET services.
 - The hospital system is designed around seven application modules which support: admissions/discharges/transfers; pharmacy; pathology; finance and administration; nursing and special services; radiology; and order communication.
 - Delivery of the system is expected in mid-1980.
- . In 1979 the Commercial Division also announced an award with G.F. Business Equipment for a facilities management contract. This award is one of the few FM contracts from a manufacturing firm to an outside services vendor.
- . Contract services for the development of manufacturing applications are also performed by the Commercial Division, in addition to operating system and compiler development activities for major hardware firms.

- The Data Services Group, contributing \$92.5 million to 1979 revenues, is the most profitable group within CSC. Although Data Services is about one-third the size of Contract Services in terms of revenues, it contributed 47% of the total operating income for the corporation in 1979.

- The principal activity of Data Services is INFONET, CSC's worldwide remote computing network service. INFONET provides a wide range of application services for commercial and government clients in business planning and control, engineering analysis, statistical analysis, and data management. A profile of the INFONET network and key application products is presented in Exhibit B.
- Approximately 93% of INFONET's revenues are derived from interactive and remote batch processing with the remaining 7% coming from batch services. The largest revenue producing applications used on INFONET are financial reporting, data management, and business analysis.
- New application products announced on INFONET include:

- . CSC Securities Library, a data base of more than 20,000 stocks, bonds, and money market instruments.
- . InSci Human Resource System, an all-purpose personnel system incorporating requirements of EEO, OSHA, and ERISA.
- . Petroleum and mining applications which provide investment analysis, risk analysis of oil and gas reserves, a history of federal offshore lease sales, and a data base of costs for offshore exploration and development activities worldwide.
- . DIADEM, EML's international forecasting system linking macro models for nine countries.
- . EML macroeconomic forecasts and forecasting models for the automotive, chemical, paper and energy services industries.
- INFONET's revenues from the Federal Government have been declining as a proportion of total processing revenues for the last several years. Processing revenues from the Federal sector contributed 47% of Data Services revenues in 1979, versus 54% in 1978 and 61% in 1977. Although a portion of this decline can be attributed to the change in status of CSC as the mandatory source for certain types of remote computing services within the Federal Government, INFONET has also achieved a significant increase in revenues from the commercial and international sectors.
- INFONET has also been involved in a major R&D effort to convert the Computer Sciences Teleprocessing System (CSTS) from Univac 1108 hardware to Univac 1100/80 equipment. Implementation of CSTS on the new hardware is scheduled to begin in mid-1980 and continue through 1983.
- INFONET services are offered through wholly owned operations in the U.S. and Europe, a 92% owned subsidiary in Canada, minority-owned affiliates in Australia and South Africa, and franchise operations in Spain, Italy, and Mexico.

INDUSTRY MARKETS

- CSC's industry markets are estimated as follows:

-	Manufacturing	4.0%
-	Transportation	.5
-	Utilities	1.0
-	Banking and Finance	3.0
-	Insurance	1.0
-	Medical	2.0
-	Distribution	.5
-	Federal Government	71.0
-	State and Local Government	7.0
-	Services	3.0
-	International	7.0
		<hr/>
		100.0%

GEOGRAPHIC MARKETS Approximately 93% of CSC's revenues are derived from domestic sales and 7% from international operations. CSC maintains offices in all major U.S. and Canadian cities and in major industrial areas in Europe, Australia, South Africa, and the Mid-East.

COMPUTER HARDWARE

- INFONET maintains five data centers located in El Segundo, Chicago, Washington, DC, Toronto, and Calgary. A total of 16 Univac 1108 computers are used in the support of network services. These will be replaced by a number of Univac 1100/80 systems.
- CSC has developed its own satellite communications network to provide remote computing services to North America and Europe. International record carriers are used for other locations.
- INFONET also offers an IBM System/370 service as a supplemental capability.

EXHIBIT B

CSC

KEY APPLICATIONS AVAILABLE ON INFONET

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – UNIVAC 1108, CSTS (GPS, BASIC SUBSYSTEMS) – IBM 370/168 & 3033, MVS (TSO, JES 2, WYLBUR) • PROGRAMMING LANGUAGES <ul style="list-style-type: none"> – ASSEMBLY – BASIC – COBOL – FORTRAN – PL/1 • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – MANAGE – SYSTEM 2000 • DATA BASES AVAILABLE <ul style="list-style-type: none"> – SECURITIES DATABASE (STOCKS, OPTIONS, BONDS) – SITE II (DEMOGRAPHIC DATA) – CITIBASE (CITIBANK ECONOMIC DATA BASE) – NATIONAL RESERVES COAL DATA BASE – LSH (OFFSHORE OIL BID HISTORY) – SEARCH (OFFSHORE OIL/GAS RETRIEVAL COSTS) • FINANCIAL APPLICATIONS/TOOLS <ul style="list-style-type: none"> – FLARES (FINANCIAL LANGUAGE FOR ANALYSIS AND REPORTING) – FIPABS (FINANCIAL CONSOLIDATIONS AND BUDGETING) • SCIENTIFIC AND ENGINEERING <ul style="list-style-type: none"> – ANSYS (ENGINEERING ANALYSIS) – COSMIC NASTRAN (STRUCTURAL ANALYSIS) – KSHEL (STRESS ANALYSIS) – TRIFLEX (PIPING ANALYSIS) – SUPERB (STRUCTURAL ENGINEERING) – GASP (STRUCTURAL ANALYSIS) – SDRC MECHANICAL DESIGN LIBRARY • INDUSTRY SPECIFIC <ul style="list-style-type: none"> – GAINS (INVENTORY PLANNING AND CONTROL SYSTEM) – ECON (FINANCIAL ANALYSIS OF OIL AND GAS VENTURES) – MECON (FINANCIAL ANALYSIS OF MINING PROSPECTS) 	<ul style="list-style-type: none"> • PROJECT MANAGEMENT <ul style="list-style-type: none"> – MISTER – SPRED • PERSONNEL SYSTEMS <ul style="list-style-type: none"> – HUMAN RESOURCE SYSTEM <ul style="list-style-type: none"> • OSHA • EMPLOYMENT HISTORY • ERISA • AAP • EEO COMPLIANCE • GRAPHICS <ul style="list-style-type: none"> – EZPERT – ENCORE – DISSPLA – GRAPH PAC – SKETCH • SIMULATION MODELING/ECONOMIC FORECASTING <ul style="list-style-type: none"> – DIADEM (FORECASTING/MACRO MODELS) – DISTAT (LANGUAGE FOR STATISTICIANS AND ECONOMETRICIANS) – SCICONIC (LINEAR PROGRAMMING) – GPSS-V (SIMULATION TOOL) – AUTOBJ (BOX JENKINS) – SIMCOST II (EVALUATES AND FORECASTS MANUFACTURING COSTS) • MATHEMATICS AND STATISTICS <ul style="list-style-type: none"> – SPSS (STATISTICAL PACKAGE FOR SOCIAL SCIENCES) – P-STAT & SCSS (CONVERSATIONAL STATISTICAL ANALYSIS) – SAS (STATISTICAL ANALYSIS SYSTEM) – BMDP (UCLA BIOMED SERIES) – IMSL (406 MATH/STAT SUBROUTINES) – MATHPACK (78 MATH SUBROUTINES) – MPS-III (SOLVES LINEAR INEQUALITIES) • IBM 370 UTILITIES <ul style="list-style-type: none"> – FAST DUMP RESTORE – IBIS – LIBRARIAN – OS WORKSTATION – PANVALET – SORT/MERGE – CONVERSE ROUTINES

COMPANY HIGHLIGHT

CONTROL DATA CORPORATION

Data Services Company
8100 34th Avenue South
Minneapolis, MN 55440
(612) 853-8100

Henry J. White, President
Division of Control Data Corporation
Data Services Revenues, Fiscal
Year End 12/31/78: \$352,600,000

THE COMPANY

- Control Data Corporation, (CDC) has been providing computing services since 1961. Twelve of CDC's computer services operations that offer data services are organized in a division called the Data Services Company.
- The computer services portion of CDC's business contributed approximately \$747 million to the company's total revenues of \$2.7 billion in 1978, or 27%. Approximately \$395 million of the \$747 million was received from educational services, consulting, and equipment maintenance services. The remaining \$352 million was derived from the operating units of the Data Services Company.
- Data Services revenues have grown at an AAGR of 25% for the past five years. A 17% increase in revenues was achieved in 1978 as shown in the following financial summary:

CDC
DATA SERVICES COMPANY
FIVE YEAR FINANCIAL SUMMARY
(\$ Millions)

ITEM \ FISCAL YEAR	1978	1977	1976	1975	1974
Total revenues	\$ 352.6	\$ 300.3	\$ 247.4	\$ 221.2	\$ 157.2
Percent increase from previous year	17%	21%	12%	41%	9%

KEY PRODUCTS AND SERVICES

- The operating units of the Data Services Company are:
 - The Service Bureau Company (SBC).
 - SBC provides business data services from over 30 batch data centers and two remote computing centers in the U.S. Major

industries served by SBC include: financial (commercial banking, savings institutions, credit unions, consumer finance, brokerage firms), insurance, manufacturing, distribution, services and government.

- . The major batch data center products support general business services: payroll, accounts receivable/payable, general ledger, sales analysis, job costing, personnel and financial analysis. Several of the batch centers also have applications which support credit unions.
- . Management timesharing application services are provided from an SBC center in Cleveland, Ohio. A profile of the applications available on the network is presented in Exhibit A.
- . Credit union RCS services are handled from a data center in Campbell, CA. FOCUS, a comprehensive share and loan accounting system, is currently used by over 1,600 credit unions.
- . In June 1979, SBC announced it would be marketing FOCUS on a minicomputer. Designed for credit unions with 4,000 or more customers, the new system is offered on an IBM Series/I Model E with at least 128K bytes of main memory, a variety of CDC peripherals, and terminals from Lear Siegler and Texas Instruments. Called FOCUS ONE, the new system will operate on a standalone basis.
- CYBERNET provides a broad range of scientific and engineering application services from five U.S. and Canadian data centers and 11 overseas locations. Clients use these services to solve technical problems in architecture, engineering, construction, nuclear and electric utilities, manufacturing, energy conservation, petroleum, mining, and government. A profile of the CYBERNET network applications is listed in Exhibit B.
- Arbitron provides a broadcast audience measurement service for radio and television stations, cable television, and advertising agencies. Arbitron collects and analyzes data to report on the viewing and listening habits of the general public. The Arbitron data center is in Beltsville, Maryland.
- Ticketron, with data centers in Hackensack (NJ) and Los Angeles, provides automated reservations and ticketing for theaters, concerts, sporting events and camping. Serving the U.S. and Canada (Ticket Reservations Systems of Canada, Ltd.), Ticketron processed about 30 million tickets in 1978.
- . In 1977, CDC released Ticketron 2000, a standalone system which automates accounting and season ticketing operations for sports teams and universities. Based on a CDC Cyber 18,

APPENDIX A

SBC

NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – IBM 303X, 370, CALL 370, CALL PLUS • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – BASIC – FORTRAN – PL/1 – SIMSCRIPT 11.5 • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – EASYTRIEVE – MINI-MIS EXTENDED (MMX) – MARK IV – X/L • DATA BASES AVAILABLE <ul style="list-style-type: none"> – BANKANAL (BANK FINANCIALS) – COMPUSTAT, EARLY OPT, VALPORT, EXSTAT, MISTI (SECURITIES DATA) – EURABANK (NON-U.S. BANK FINANCIALS) – EURARATE (CURRENCY CONVERSION) – FDIC/FSLIC/NCVA – MUNIPRICE (MUNICIPAL BONDS) – FINB (FINANCIAL INSTITUTIONS) – FAPRS (GOVERNMENT LOANS, GRANTS) – EVANS ECONOMICS – SITE II (DEMOGRAPHIC AND HOUSING) – DRI CAPSULE DATA BASE – ORR (CONSTRUCTION ESTIMATING) – LIFE RATES DATA BASE • FINANCIAL APPLICATIONS/TOOLS <ul style="list-style-type: none"> – PROPHIT II (PLANNING/MODELING) – TIMEPACK II (TIME SERIES) – RISKAN II (RISK ANALYSIS) – PICTURE-PAC (PLOTING/GRAPHICS) 	<ul style="list-style-type: none"> • BANKING <ul style="list-style-type: none"> – CERTIFICATE OF DEPOSIT (CDCOM) – DEBIT BANK SYSTEM – DOMESTIC FUNDS TRADING – FOREIGN EXCHANGE, LOANS, DEPOSITS – ST. JOSEPH PERSONAL TRUST – SAVINGS AND LOAN MODELS • SECURITIES <ul style="list-style-type: none"> – ASSET, BASIS, BOND/NOTE PRICING, BONDSWAP, DEBIT, REFUND – MUNICIPAL BONDS (BID, MBOFFER) – PORTFOLIO MANAGEMENT (OPSCREEN) – FINANCIAL PLANNING (EXECPLAN) • INSURANCE <ul style="list-style-type: none"> – MUFV LIFE INSURANCE SERVICES – PENSION PLAN APPLICATIONS – TAXMOD (LIFE INSURANCE) • MANUFACTURING <ul style="list-style-type: none"> – ESCORT (ORDER ENTRY/CONFIRMATION) – MFG/PLUS (MATERIAL REQUIREMENTS) • CREDIT UNIONS* <ul style="list-style-type: none"> – FOCUS (SHARE AND LOAN ACCOUNTING)* • MATHEMATICAL <ul style="list-style-type: none"> – MATH-AIDS – MIDILPD – MPSX • STATISTICAL <ul style="list-style-type: none"> – DATA PACK, STATPACK, SAS (STATISTICAL ANALYSIS) – APL STATISTICAL LIBRARY – BMD/BMDP BIOMEDICAL PROGRAMS – GPSS-V (SIMULATION)

* AVAILABLE FROM CAMPBELL, CA. DATA CENTER

EXHIBIT B
CYBERNET
NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> — CDC CYBER 170 AND 200/NOS, SCOPE • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> — ALGOL, APL, BASIC, COBOL, COMPASS, FORTRAN, SIMULA, SIMSCRIPT • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> — BASIS — SKILTEC — IPF — SYSTEM 2000 — IS/ATHENA — TOTAL — LEXITEC — TOTAL/ATHENA • DATA BASES AVAILABLE <ul style="list-style-type: none"> — CEDA — TECHNOTECH — EBIS • MANAGEMENT SCIENCES <ul style="list-style-type: none"> — APEX III — PPS IV — DCO/TRANPLAN — PROPLAN — EZPERT — PROSE — GPSS V — SIMSCRIPT 11.5 — IMSL — SIR — NETFLOW II — SORITEC — PDS/MaGen — SPSS • FINANCIAL APPLICATIONS <ul style="list-style-type: none"> — ASCENT SYSTEM — SIBYL/RUNNER — IFPS • CIVIL ENGINEERING <ul style="list-style-type: none"> — BARS — SPAM — CELS — SPSTRESS — DESCUS — STRU-PAK — FAAST — SURNAL — GTICES/STRU DL — SYSTEMS PROFESSIONAL — POSTEN • ELECTRONICS <ul style="list-style-type: none"> — ACSL — MICROLIB — ARRAYGEN — PREDICTOR — CC-TEGAS3 — RESULTS — CDC-SPICE2 — RFOPT — CSSL — SYSCAP II • ENERGY CONSERVATION <ul style="list-style-type: none"> — BLAST — FCHART — CALERDA — RSVP — ECUBE — SOLCOST — EP — TRNSYS • GRAPHICS <ul style="list-style-type: none"> — DISSPLA — SACM — PERSPECTIVE — SURFACE-MAP — PLOTPAC — TIGS — PLOT-10 — UNIPLOT • MACHINERY <ul style="list-style-type: none"> — CADENSE — SDRC/SUPERTAB — MITAS II — SINDA-9 — SDRC/IMP — THERMAL — SDRC/MDL — TRASYS — SDRC/SUPERB 	<ul style="list-style-type: none"> • NUCLEAR FUEL MANAGEMENT <ul style="list-style-type: none"> — ARMP — LEAHS — CITATION — PDQ7LEAHSV2 • OPTICAL SCIENCES <ul style="list-style-type: none"> — OPTICAL SCIENCE LIBRARY • PETROLEUM AND MINING <ul style="list-style-type: none"> — GOLOG, GRAPH, — SSTRAN, MTRAN, HCOMP, — MULTI-LITH — TRANSFLOW, TLIQ, TCON — MINEVAL, MSCDES — STAMOR — SSI/100 • PIPING ANALYSIS <ul style="list-style-type: none"> — AAA-T — NUPIPE — ADLPIPE — PIPERUP, PRTHRUST — CAPIM — PIPESD — DIS — PIPLIN II — EZFLEX — WAVENET — HANGIT • POWER SYSTEMS OPERATIONS AND DESIGN <ul style="list-style-type: none"> — COMMIT — PROCOS II — HEAT RATE CURVE — SYNFE — MEVAL — SYNTHA II • POWER SYSTEMS PLANNING <ul style="list-style-type: none"> — EMTRAN — SSR — POWER FLOW — STABILITY — SCAN • RADIATION SHIELDING AND CRITICALITY <ul style="list-style-type: none"> — AMPX — KENO-IV — ANISN — MORSE-CG — DOT 3.5 — SPAN-4 — DOT IV • REACTOR OPERATIONS SUPPORT <ul style="list-style-type: none"> — NIPS — PREM • REACTOR SAFETY ANALYSIS <ul style="list-style-type: none"> — COBRA IV — HYDROMIX — CONTEMPT-LT — PISCES — DYNODE-2 — RELAP4/REPIPE — FLUSH — WREM — GALE • STRUCTURAL ANALYSIS <ul style="list-style-type: none"> — ADINA — MARC-CDC — ANSYS — SACS — ARGUS — SAMBAS — CDC/NASTRAN — STARDYNE — EAC/EASE2 — UNISTRUC • TELECOMMUNICATIONS <ul style="list-style-type: none"> — CDCSAVE — NPJA — CNET — PWAC — COMNET — TELTAPS

Ticketron 2000 leases for \$35,000 a year. Approximately 18 systems have been installed, including Pennsylvania State University, the Los Angeles Forum, the Meadowlands Sports Complex in New Jersey, and the Los Angeles Dodgers.

- . A Ticketron system is being installed for the Shubert organization in New York to process ticket reservations for Shubert Broadway productions. This system will permit credit card phone purchases of tickets via a toll-free 800 number.
- . Ticketron also has a separate Automated Wagering Division.
- ACTION Data Services based in St. Louis, provides on-line processing and accounting services to the consumer finance industry.
- Brokerage Transaction Services provides data services to brokerage and specialist firms from a data center in New York. Services provided include applications to support stock transactions (front office) and accounting (back office) areas. The accounting software for back office operations is also sold for in-house use.
- EFT Data Services, based in Cleveland, provides payment authorization services to commercial banks which in turn market the service to retail merchants. Point-of-sale authorization/verification services are provided for credit cards and checks.
- Station Business Systems (SBS) provides program scheduling and accounting systems to broadcasting companies. Located in Greenwich, CT, SBS sells a standalone system based on Datapoint hardware for radio and television stations and offers a similar system for cable television companies using Texas Instrument hardware.
- Electronic Trading Services, based in Jersey City, provides a processing service that allows brokers and dealers to electronically buy and sell stocks.
- Banking Data Services, located in Los Angeles, provides a comprehensive on-line service to commercial banks in the areas of demand deposit, loan and savings accounting, and general ledger.
- TECHNOTECH is a computer based technology exchange service which brings together those who need technology with those who have technology. The TECHNOTECH data base is available through CYBERNET.
- CYBERSEARCH is a computerized recruiting and staffing service that matches professional employees to the needs of employers. CYBERSEARCH is available on CYBERNET.

COMPANY HIGHLIGHT/CONTROL DATA CORPORATION

INDUSTRY MARKETS The Data Services Company derives revenue from every industry sector. Primary industries served are banking and financial, manufacturing, utilities, government and petroleum.

COMPUTER HARDWARE AND SOFTWARE

- North American data center locations for CYBERNET services are in Minneapolis, Rockville, Houston, Sunnyvale and Toronto, Canada. International centers are in London, Paris, Brussels, Stockholm, Frankfurt, Melbourne, Johannesburg, Tel Aviv, Mexico City, Rijssijk (Holland), and Rio de Janeiro. A Tokyo data center will be opened in mid-1980. Mainframes used in the centers are primarily CYBER 170s with NOS and SCOPE operating systems.
- The SBC remote computing service center in Cleveland uses IBM 370/158 and 303X equipment with the CALL 370 and CALL PLUS operating system. CALL 370 uses a custom operating system and CALL PLUS uses MVS. The Campbell (CA) data center uses an IBM 370/158 and CDC Omega 480s. The SBC batch data centers use IBM 360/370 equipment.

COMPANY HIGHLIGHT

UNIVERSITY COMPUTING COMPANY

UCC Tower
Exchange Park
Dallas, TX 75235
(214) 353-7100

John Kason, Chairman and President
Subsidiary of Wyly Corporation
Total Employees: 1,590
Total Revenues, Fiscal Year End
12/31/78: \$78,877,000

THE COMPANY

- University Computing Company (UCC), formed in 1963, is the oldest computer utility services vendor in the U.S. Although the company has been plagued with financial difficulties of its parent organization over the last several years, it has resolved its financial problems and appears to be making positive efforts to maintain and expand its position as one of the leading suppliers of processing services and software products.
- UCC's financial problems began when Sam Wyly, founder, began to diversify by absorbing other business into UCC. Insurance, terminal manufacturing, computer leasing, and energy services companies were acquired. The biggest gamble of all was starting DATRAN in 1968, a data communications network service in direct competition with AT&T. In December 1972, Wyly Corporation was formed and the computer services functions were concentrated in UCC.
- DATRAN was a continual drain on cash which, when added to fire and casualty losses of the Gulf Insurance Company, proved too much of a burden for Wyly Corporation to carry. The insurance, leasing, energy services, and terminal manufacturing businesses were eventually sold.
- Through August 1976 Wyly, Careal Holding (a Swiss investment firm which currently owns 50% of Wyly) and others invested \$100 million in DATRAN. Unable to finance DATRAN's operating losses or meet cash requirements for further development, DATRAN filed a bankruptcy petition on August 27, 1976.
- In February 1978, Wyly successfully completed a recapitalization plan. Under the terms of the plan, approximately \$91.5 million in debt, plus related interest, was exchanged for 9.3 million shares of a post reverse split of Wyly common stock and \$4.1 million in cash.
- Wyly's 1978 revenues were \$78,877,000, a 12% gain over 1977 revenues of \$70,787,000. The nine month operating results of Wyly, ended September 30, 1979, shows revenues at \$64.1 million, a 12% increase over 1978 revenues during the same period of \$57.1 million.

COMPANY HIGHLIGHT/UNIVERSITY COMPUTING COMPANY

- A five-year financial summary reflecting company losses during the 1974-77 period and the affect of the recapitilization plan in 1978 follows:

WYLY CORPORATION FIVE YEAR FINANCIAL SUMMARY (\$ Thousands, Except Per Share Data)

ITEM \ FISCAL YEAR	1978	1977	1976	1975	1974
EDP services revenues	\$ 76,943	\$ 68,866	\$ 61,801	\$ 62,175	\$ 72,508
Interest and other income	1,934	1,921	1,649	2,645	1,785
Other revenues (A)	-	-	-	-	13,441
	\$ 78,877	\$ 70,787	\$ 63,450	\$ 64,820	\$ 87,734
Income (loss) before taxes and extraordinary item	\$ 4,801	\$ (2,626)	\$ (3,647)	\$ (6,121)	\$ 6,771
Income (loss) before extraordinary item	\$ 2,586	\$ (4,634)	\$ (71,050)	\$ (52,246)	\$ (15,306)
Extraordinary item (B)	\$ 72,761	-	-	-	-
Net income (loss)	\$ 75,347	\$ (4,634)	\$ (71,050)	\$ (52,246)	\$ (15,306)
Earnings (loss) per share	\$ 7.49	\$ (2.23)	\$ (34.13)	\$ (25.10)	\$ (7.35)

- (A) Revenue gain due to contract termination with LTV Aerospace Corporation.
- (B) Extraordinary credit resulting from the recapitilization plan in February 1978.
- In February 1979, Sam Wyly, founder and Chairman of the Board, resigned. His resignation was prompted by an investigation by the Securities and Exchange Commission of possible illegal practices in the exchange of Wyly stock for cash and services.
 - With much of the turmoil behind, John Kason, the new Chairman, is looking forward to stabilizing and increasing UCC's profit margins by:
 - Increased sales of software products.
 - Expanding network services.
 - Acquiring additional products or companies.
 - The marketing rights to a new product, Reliability Plus, have recently been acquired from its developer, Reliability Research Inc.
 - Wyly is actively looking for acquisitions in the software products and processing services area. With \$55 million in federal income tax credits, and approximately \$55 million in capital loss carryforward credits, acquisition ventures could be beneficial to both parties.

- UCC's organizational structure is centered within two fairly autonomous operations: U.S. and Europe.
 - The Software Division and its European counterpart, Software Products International, market UCC's system and application software products.
 - Processing services, both remote and batch services, are provided by:
 - Computing Services Division, previously known as The Scientific and Engineering Division, which serves the U.S. and Canada.
 - European Utility, based in England, which provides remote computing and batch services to the United Kingdom and continental Europe.
 - Automation Centers International (ACI) maintains nine data centers and provides processing (primarily batch) to customers in Austria, Belgium, Germany and Switzerland.
- As of December 31, 1978, UCC employed 1,590 personnel: 640 in the U.S. operations and 950 in Europe. At the present time there are 654 U.S. employees segmented as follows:

Computer Services	319
Software Products	281
General and Administration	<u>54</u>
	654

KEY PRODUCTS AND SERVICES

- Approximately 75% (\$58.3 million) of UCC's 1978 revenues were derived from processing services and 25% (\$19.1 million) from software product sales. A further breakdown of UCC's revenue sources follows:

Revenue Source	(\$ Millions)		
	U.S. & Canada	International	Total
Processing Services			
- Remote Computing	\$19.3	\$20.0	\$39.3
- Batch	-	19.0	19.0
Software Products			
- Operating Software	8.6	1.6	10.2
- Applications Software	<u>8.9</u>	<u>-</u>	<u>8.9</u>
	\$36.8	\$40.6	\$77.4

- UCC has approximately 200 applications available on its network. Application emphasis in the U.S. is in engineering, electronics, structural and nuclear areas as shown in the network profile (Exhibit A).
- Two-thirds of the U.S. Division's revenue of \$19.3 million is derived from five application areas: numerical control, electronics, nuclear (plant design), structural analysis, and petrochemical applications.

EXHIBIT A

UCC

U.S.NETWORK APPLICATION PROFILE

APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<ul style="list-style-type: none"> • OPERATING ENVIRONMENT <ul style="list-style-type: none"> – UNIVAC 1108, 1100/81 – CDC CYBER 175, 6600 – IBM 370/158 • PROGRAMMING LANGUAGES SUPPORTED <ul style="list-style-type: none"> – FORTRAN – COBOL • DATA MANAGEMENT SOFTWARE <ul style="list-style-type: none"> – db IV (UCC DBMS) • CHEMICAL ENGINEERING <ul style="list-style-type: none"> – IRIS, PDSMS • STRUCTURAL ENGINEERING <ul style="list-style-type: none"> – ANSYS, NASTRAN/COSMIC, NASTRAN/MAC NEAL-SCHWENDLER, PCA, SACM, SAP 4-6, SEPSI-5, SPACE IV, STRESS II, STRUDL-II, TRI DRILL • MARINE ENGINEERING <ul style="list-style-type: none"> – MRI/MARRS, SACS II, SHIP HULL CHARACTERISTICS • PIPING ANALYSIS <ul style="list-style-type: none"> – ADLPIPE, AUTOFLEX, DYNAFLEX, EZFLEX, FLANGE DESIGN, TRIFLEX, WERCO • HEAT TRANSFER <ul style="list-style-type: none"> – AC-2, AIDEX, FRNC-5, HTRI, SINDA • PROCESS ENGINEERING <ul style="list-style-type: none"> – AMOCO, CHEMSHARE, NGPA, SSI/100, SSI/DR 01 	<ul style="list-style-type: none"> • ARCHITECTURAL ENGINEERING <ul style="list-style-type: none"> – BUILDING ENERGY (EEC, ERCK, ERE, TCR), 1100-ICES, LUMEN-2, MEDSI • ELECTRONICS <ul style="list-style-type: none"> – D-LASER, MAGIC, MICROPROCESSOR, RM PREDICTOR, SCEPTRE, SPICE, UCCAP, MONOCHIP • NUMERICAL CONTROL <ul style="list-style-type: none"> – UCC APT • LINEAR PROGRAMMING <ul style="list-style-type: none"> – FMPS, GAMMA 3.0 AND 3.4 • MATH/STATISTICS <ul style="list-style-type: none"> – BMD SERIES, IMSL, MATH-PACK, STAT-PACK • SIMULATION <ul style="list-style-type: none"> – GPSSV, GPSS/UCC, MIMIC, SIMSCRIPT • NUCLEAR (MAJOR CATEGORIES) <ul style="list-style-type: none"> – TRANSIENTS AND THERMAL HYDRAULICS – LICENSING AND SAFETY ANALYSIS – CONTAINMENT ANALYSIS – SHIELDING ANALYSIS – CROSS SECTION DATA SET – IN-CORE MANAGEMENT • OTHER <ul style="list-style-type: none"> – WORD PROCESSING (FASTEXT AND U TYPE) – FASBAC APPLICATIONS LIBRARY – PROJECT MANAGEMENT (N 5500) – VESSEL DESIGN (VESSEL AND WERCO)

- The largest revenue product is UCC APT, a language processor for programming numerical control machine tools. Revenues from APT are running \$6-8 million per year.
 - New products recently announced on UCC's network services are:
 - SUPERTAB, an interactive graphics system for finite element modeling.
 - DISSPLA, a general purpose subroutine plotting system used to produce graphics.
 - Halcon Piping Material Control System (PMCS) for material handling and tracking.
 - UCC also plans to develop additional applications within the computer aided design and manufacturing areas (CAD/CAM). A joint marketing agreement was signed between UCC and Applicon, Inc. in February 1979 which will combine Applicon's 3-D graphics system (CAD) with UCC's CAM software. The product is designed for companies interested in turnkey CAD/CAM systems.
 - UCC's European Utility group maintains three data centers in England and provides:
 - Scientific and engineering applications similar to those offered in the U.S., in addition to European developed products.
 - Standard packages covering payroll, credit accounting and management systems for local usage.
 - In 1978 UCC Europe began offering customers an option to link their own minicomputers to the utility network.
 - Automation Centers International (ACI) provides commercial data processing services to organizations within wholesale, automotive, banking, insurance, construction, metal, textile and publishing industries. Applications are general business in nature and batch oriented: accounting, payroll, statistics, stock control and billing.
- The Software Services group has historically been the most profitable group within UCC. Software products marketed are presented in Exhibit B.
 - Operating (or system) software products have been successfully marketed by UCC since 1971. As shown in Exhibit B, they have been well accepted in the marketplace and currently have a total installed base of over 3,400 packages.
 - UCC's strongest areas of expertise are data set management, work flow control and data dictionary design.
 - New products will be concentrated in the above areas and in productivity software tools for programmers.
 - A newly acquired product, Reliability Plus, measures the reliability of all major devices used in a computer center. An added service is available to users of the product. Once a month users send a tape to UCC containing peripheral device performance data. The tapes are processed by UCC and a device performance report is returned to clients.
 - Applications for the banking industry have been marketed by UCC since 1972. The banking software operations were not profitable in 1978. One of the reasons for this is the narrow marketing area of the product

EXHIBIT B
UCC SOFTWARE PRODUCTS
(U.S. AND INTERNATIONAL)

PRODUCT NAME	FUNCTION	PRICE	NUMBER INSTALLED
<u>OPERATING SOFTWARE</u>			
UCC ONE	TAPE MANAGEMENT	\$ 13,900	1,300
UCC TWO	DOS TO OS CONVERSION	36,000	700
UCC THREE/ADAM	DISK MANAGEMENT	11,000	130
UCC SIX	PARTITIONED DATA SET SPACE MANAGER	77,050	140
UCC SEVEN	AUTOMATED PRODUCTION CONTROL	37,500	90
UCC TEN	DATA DICTIONARY/MANAGER	18,000	260
UCC FIFTEEN	JOB RECOVERY MANAGEMENT	9,250	500
UCC R+	RELIABILITY MEASUREMENT	12,000	300
<u>APPLICATIONS SOFTWARE</u>			
UCC FCS	FINANCIAL CONTROL FOR BANKS	36,500-55,000	205
UCC FCO	ON-LINE VERSION OF RCS	10,000-12,000	37
UCC CIF	CUSTOMER INFORMATION FILE	45,000-72,000	79
UCC MICR	MICR CHECK PROCESSING	45,000-90,000	103
UCC CLS	COMMERCIAL LOAN SYSTEM	40,000-60,000	52
UCC ILS	INSTALLMENT LOAN SYSTEM	40,000-60,000	65
UCC CTS	CONTROLS ATM TRANSACTION	50,000-60,000	20
UCC CFCS	FINANCIAL CONTROL FOR NON-BANKING	36,000-55,000	125
<u>MANUFACTURING</u>			
UCC APT	NUMERICAL CONTROL	25,000	NA
UCC LATHE MODULE	LATHE PROGRAMMING LANGUAGE	5,000-12,500	NA
UCC ADVANCED CONTOURING MODULE	PROGRAM TOOL FOR MULTI-AXIS MACHINES	15,000	NA
UCC POST-PROCESSORS	POSTPROCESSOR FOR MACHINE/TOOL CONTROL	3,500-15,000	NA

line: about 850 potential clients. UCC is currently investigating developing or acquiring products within selected industries.

- New application software recently introduced was UCC/FCS On-Line, an on-line edit, entry and inquiry capability to the UCC Financial Control System (FCS).

INDUSTRY MARKETS

- UCC's industry market revenues for both U.S. and European operations are estimated as follows:

- Discrete manufacturing	20%
- Process manufacturing	20
- Transportation	5
- Utilities	5
- Banking and finance	15
- Insurance	5
- Medical/Hospital	2
- Education	2
- Distribution	15
- Government	3
- Services	5
- Other industries	3
	<hr/>
	100%

GEOGRAPHIC MARKETS Approximately 52% of UCC's total revenues are derived from European operations and 48% from U.S. and Canadian clients.

COMPUTER HARDWARE

- UCC maintains one data center in Dallas, Texas which provides remote computing services to U.S. and Canadian cities. Equipment located in the facility consists of:
 - 4 Univac 1108s, UCC EXEC.
 - 2 Univac 1108s, EXEC 8.
 - 1 Univac 1100/81 EXEC 8.
 - 1 CDC Cyber 175, NOS/BE.
 - 1 CDC 6600, NOS/BE.
 - 1 IBM 370/158, MVS.
- UCC plans to replace the 370/158 with a 168 to increase use of the system by external users. At present, the 158 is almost entirely used for software development activities. A transparent front-end interface between applications residing on CDC, Univac, and IBM equipment will be added. The CDC 6600 is also scheduled to be replaced by a Cyber 176.

MULTIPLE ACCESS, INC. - ACTION STUDY

ABSTRACT

This custom study of Canada Systems Group's (CSG) recent acquisition of Multiple Access, Inc. (MAI) is in accord with INPUT's letter proposal to CSG. The proposal indicated that INPUT would make recommendations to help MAI obtain a "stable and predictable revenue stream" and "achieve a 10% pretax profit on sales." The study reviewed the historical market orientation of MAI as well as its equipment, software, facilities and customers. Drawing on previous INPUT market research, specific market forecasts were developed for the Los Angeles area in the market segments where MAI is competitive. The study addresses the synergy between CSG and MAI, and recommends a series of management actions.

